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STUDY
ON
AIRPORT SLOT ALLOCATION

FINAL REPORT

A Study commissioned by the Department of Transport

JOHN HULET
HUGH LAKE
GRAHAM PERRY

Strategic Consultancy Practice
SD-Scicon UK Ltd
Pembroke House
Pembroke Broadway
Camberley
GU15 3XD

Telephone (0276) 686200
Fax (0276) 683511

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1. EXECUTIVE SUMMARY

101. This is the final report of a study, let by the UK Department of Transport to the Strategic Consultancy Practice of SD-Scicon, to investigate alternative methods of allocating slots at congested airports within the European Community.

102. The first stage of the study analysed the fundamental characteristics of slot allocation systems and developed methods of assessing their relative merits. Four alternative generic types of options were identified as worthy of further analysis.

103. Of these, the Department asked for a Regulatory and a Market Hybrid option to be developed and compared with the current system. Both options use a system of 'fields' to segment the market in order to maintain an acceptable balance of traffic. The Regulatory option lies close to the current system, retaining grandfather rights, but with harsher sacrifice and confiscation rules which would involve the surrender of 5% to 10% of current slots at irregular intervals to form a pool. Slots would be allocated to specific new entrants without specifying for which routes they were to be used.

104. The Market Hybrid uses the sale of seven year leases of slots as the allocation mechanism. For five years, incumbents would offer up 20% of their grandfather slots to the auction each year. Incumbents would have the right to recover a proportion of these by matching the highest bid. Trading would be conducted through an independent broker. Monopoly within any field would be controlled.

105. The current system is certainly anti-competitive and the new options would open up the market; we consider that both could be made to work. They both address, in different ways, the key issues of the grandfather rights to slots and the need for provisions to allow new entrants access to the congested slot market. Users can be expected to benefit from the increased competition. Both options contain measures to remove unfair commercial practices, and to protect efficient airlines from unreasonable erosion at their critical hubs and on their principal routes.

106. Accurate predictions of all the effects of the options on air transport users will require modelling. While there will be undoubted benefits to users, the more efficient use of a fixed number of slots means that some marginal services are bound to fail, and others will be displaced by more efficient operations away from congested airports.

107. We advocate that the administration of slot allocation should be by three distinct functional levels, the policy level being embedded in government. We see no reason for the creation of a large bureaucracy, but advocate the use of the current methods at the lower levels, supplemented where appropriate, using the considerable skills of the current practitioners. A formal policy function is needed even if it proves possible to maintain the current IATA self regulation processes at the allocation and coordination levels.

108. We note that the EC is entering the political vacuum at the policy level; we feel this trend will continue. Individual countries should take advantage of the respite in the pressure on capacity during the current downturn in airline traffic to formulate coordinated policy objectives.

109. The legal issues raised in operating any freer option alongside the many current bilateral and international agreements are considerable. We believe that change is inevitable, and can be negotiated, but only as part of a properly resourced plan.

110. A freer market for slots can be developed but a number of critical issues should be addressed before radical change is set in train. Internationally, the implementation of slot allocation is extremely diverse. Changes must be made cautiously, against endorsed objectives and to a coherent plan. The resistance of many operators and administrators to change, particularly to the use of money and to the sacrifice of slots, may mean that radical changes will have to be introduced by regulation rather than by consensus.

111. We were required to assume that the Market Hybrid taxed money out of the system. We suggest that this may make this particular option unacceptable. While we are sure that operating efficiencies will rise under the Market Hybrid, if they did not and costs were passed on, long haul fares into congested airports could increase by up to 10% and short haul fares by more.

112. We suggest that the methods and tools developed during this study should be used to develop the options further. They should also be used to assess proposed modifications to the current system, to ensure that they are consistent with a declared logical strategy.

2. INTRODUCTION

DEMAND, CONGESTION AND SLOT ALLOCATION

201. Recent economic and international events have, for the first time in years, reduced the seemingly never ending demand for access by airlines to Europe's principal airports. The consequences for operators' businesses from these events are nearly all negative; the only cheering aspects are that saturation seems that little bit further away, and that some capacity has become available to satisfy the aspirations of those undaunted by the business climate. Nevertheless, traffic is expected to recover to the level forecast by the Civil Aviation Authority (CAA) in CAP 570: use of London Heathrow will reach 97% of its aircraft handling capacity by 1995, and 100% by the year 2000. London Gatwick is forecast to be saturated by 1995. Across Europe, air traffic is predicted to double by the year 2005. All this is expected to put an increasing strain on the way the arrival and departure slots for aircraft are allocated at congested airports.

202. Historically, the allocation of airport runway slots to airlines and other users has been administered by the users themselves, and very effectively. The guidelines for the method employed are laid down by the International Air Transport Association (IATA), and hitherto have followed the principle of historic precedence ('grandfather' rights), whereby carriers operating a scheduled or charter service one season have first call on the slots concerned for the following corresponding season. The airline specialists who make the system work do so by combining the guidelines with professional consensus, and plan operational programmes and resolve disputes in ways which generally satisfy all those in the industry. Inevitably, as congestion at some of the world's airports has increased, governments and other authorities have taken an interest in the possible counter-competitive aspects of the present system. Critics have argued that potential newcomers have been denied the chance to compete, that existing carriers have retained slots for strategic reasons when business logic indicates they should have given them up, and that non-IATA operators have been seriously disadvantaged.

203. IATA has responded to these arguments. The guidelines have been modified to provide for new entrants. Non-IATA carriers now participate in the scheduling conference. 'Use it or lose it' rules, not applied too heavily in the past, have received new emphasis of late. But all these changes, and others proposed by the Association, have not compromised the grandfather rights. Looming congestion and saturation strongly suggest that other means of allocating slots, not necessarily acknowledging

grandfather rights, will become very necessary if competition is to be encouraged. Governments want competition, as a route to greater efficiency and user choice. They see the essential signs of these in a healthy availability, turnover and use of the limited slots available. Not surprisingly, airlines are opposed to losing their traditional rights, the 'given' that is one of the few stable planning factors they enjoy. We have noted that the strength of their individual opposition is directly related to their vested interest in the grandfather principle. But it cannot be denied that the present system has served the industry well, and has proved to be both robust and responsive in the wildly changing business conditions which the airlines seem fated to endure. The IATA system runs through goodwill, commitment and professionalism. Intervention by government bodies to achieve various ends of policy, however well intentioned, seems just not credible to many in the industry. Can government, or any authority, introduce a replacement for the existing slot allocation system which would work, let alone be fair? Do they know how difficult it is? The very notion, let alone the implementation, threatens the stability of an industry which at best is only marginally profitable, and in the current business climate is a long way from that.

INTEREST BY THE EUROPEAN COMMISSION

204. In the lead in Europe in proposing reform of the method of slot allocation has been the European Commission (EC). The mood in Europe is one of liberalisation of air transport, and the Council of Ministers' declared policies are to lower the barriers for market entry and to stimulate competition between carriers. The threat of removal of block exemption from cartel regulations is being used to impose changes to IATA's rules. The Commission's concern about the lack of competition within the present system is shown by their recent proposal for a Council regulation on common rules for the allocation of slots at Community airports, published in January 1991. These rules contain key provisions for new entrants and, when necessary to foster competition, accept the principle of withdrawal by Member States of grandfather rights from incumbents. Thus the airlines' worst fears are realised. They are faced with compulsory sacrifice of their historical rights, to achieve doubtless noble ends but hardly in their own interests, perhaps even forcing some out of business. They might reasonably be expected to resort to law to defend themselves against such a threat.

INITIATIVES BY THE UK DEPARTMENT OF TRANSPORT

205. In the UK, the Department of Transport listened to the many voices in the multi-airline and already very competitive British industry, and saw problems coming. In 1990,

jointly with the CAA, it commissioned us, the Strategic Consultancy Practice of SD-Scicon UK Ltd. to study slot allocation. We were to compare possible future systems for the allocation of slots at congested airports with the present system of scheduling committees and grandfather rights.

206. In Stage One of the study, we used a fundamental systems approach to develop new techniques which allow the basic characteristics of different slot allocation methods to be compared: their operation, their practicality and their meeting of policy objectives. This approach led us to identify promising new methods of slot allocation, and these ranged from the highly regulated to the most free market. We delivered our detailed Stage One report to the Department of Transport and CAA in November 1990, presenting 21 options analysed in detail, narrowed down to four specific systems deemed worthy of more detailed study in Stage Two. They were a fully regulated administrative option, an administrative hybrid (non-pricing), a market hybrid (involving the sale of restricted leases), and a relatively unfettered free market option. In our analysis we were clear about the likely effects of unleashing the latter scheme on a fragile industry, and pointed to the need for an implementation strategy which had been clearly thought through and which reflected clearly stated policy objectives. In February 1991, the Secretary of State announced that Stage Two of the study was to go ahead, by focusing initially on just two of the options: the 'full regulatory' administrative option and the 'market hybrid', the more radical option involving money and thus market forces. This is our final report.

STAGE TWO TERMS OF REFERENCE

207. The Terms of Reference for the Stage Two work are those for Stage One plus an appendix. The full TORs are in Annex D to this report. We are required to work up the design of methods of slot allocation that are stable, predictable, and responsive to changes in market conditions. They have to satisfy the policy objectives identified during the Stage One work, and need to be robust in the face of future policy changes. We must assess the response of the airline industry to each, and consider their impact on the competitive structure of the industry. We were not required to do any economic modelling of the system. We have to comment on the legal implications of 'ring-fencing' slots into categories which will be allocated in different ways. And we have to suggest workable ways of implementing the schemes which will cause the air transport industry to respond positively, and which will minimise uncertainty and disruption. We have listened to the airlines, as many as we had time to see, and they have been frank with us. As businessmen, we understand their fears. The current system isn't broken; why mend

it? How can the people designing these new methods be accountable in any meaningful business sense if the schemes prove unworkable? Our schemes, both in concept and detail, have been devised with all the practicalities for the industry uppermost in our minds. Where something cannot work until governments have changed something, implemented something else, or agreed an issue between themselves, we have said so. In this report, we present as much detail behind our thinking as we can. Sometimes, however, the very detailed reasoning behind the minutiae of the design features is too lengthy to be included here and will be found in background papers. Where some features appear unusual, however, and a simpler alternative seems readily to suggest itself, we have explained our particular reasons for insisting that the feature should be as we say.

DEFINITION OF KEY TERMS

208. Because developing new slot allocation methods involves various new ideas and concepts, the terminology can be both ambiguous and confusing. A full glossary is included at the end of this report, but the definition and explanation of a few of the more common terms are presented here to make what follows more readily understandable.

Slot

209. A slot is the approval to use a runway for a single movement, either a take-off or a landing, at a certain time on a particular day. It has with it the automatic assumed right to local and en route ATC coverage, and the appropriate groundside access (apron, gate, terminal facilities) at an airport (co-ordinated or not). Note that there is an inevitable distinction between the planned (co-ordination) slot, which is associated with a time window of only 10-15 minutes, and the actual 'on the day' slot which is tactically managed according to the operational realities.

Cluster

210. A cluster of slots is a package of slots reflecting the operational and commercial requirements of airlines. A cluster might comprise a number of landings and take-offs spread throughout the day. Depending on the nature of operations (scheduled, charter, short or long haul, shuttle service, etc), some clusters could be (for example for a shuttle operation) up to 15 landings and 15 take-offs every day of the week for the entire summer or winter season. At the other extreme, a cluster might be one arrival followed by a departure slot (two in total) per week for a weekly long haul service.

Field

211. A field is a grouping of slots which must be used in a certain way (eg long haul or short haul), or for certain types of service (eg bilateral, public service). Different fields have different rules for the use and allocation of slots within them. Their existence is made necessary by international legal constraints on the use of airports, and an example of their use can be found in the USA where domestic, international, commuter and essential air service fields of slots exist at the same airport.

Trading

212. Trading is the means by which slots are transferred from one airline to another. In the present system, trading is a one-for-one swap between airlines with no money changing hands. In a new system it might be a swap of dissimilar numbers of slots, or a sale, or a lease. A sale might be of a slot in perpetuity, or the right to use that slot for a specified period, such as a week (or even one day).

Sacrifice

213. Slots become available for new of different users by means of slot sacrifice. This could be voluntary, by an operator who no longer requires them, or it could be forced on a carrier by regulation.

Confiscation

214. Confiscation is the penal sacrifice of slots. This may be through enforcement of 'use it or lose it' rules, or for infringement of some other regulation.

The Agency

215. The Terms of Reference of the study require us to consider the workings of 'the agency' in connection with the administration of slot allocation. We observe that the term contains the notion of bureaucracy, and large bureaucracy at that. In reality, we believe a working agency could be quite small, perhaps no bigger than the coordinator and his staff today. At some airports, it might be one man. It is the functions of the agency that are the same regardless of its size: it is the executor of policy handed down to it by the regulators, and it is the means by which the allocation and day-to-day coordination for the airport takes place.

STRUCTURE OF THE REPORT

216. Next in this report, Chapter 3 outlines the present system, its strengths and weaknesses and the changes it faces. Much has been written on the system and we have not sought to repeat it here; we have simply addressed the aspects and issues which are relevant to this study.

217. In Chapter 4, we examine the basics of slot allocation, and how the simple notion of meeting demand with supply has evolved into an instrument of policy. The fundamental parts of any slot allocation system are identified and described, and the relationship between them presented diagrammatically. The key technical issues we have identified during our analysis are discussed, together with their part in the formulation and assessment of new slot allocation methods.

218. Chapter 5 discusses the ring-fencing of slots, and expands on our concept of fields. The practical issues affecting slot allocation are examined, including the diversity of airlines serving congested airports and the different operational, legal and policy matters affecting European and international air transport operations.

219. In Chapter 6, the two slot allocation methods selected for detailed study in Stage Two are described. The full detail of each is presented later in an annex, but this chapter highlights the general objectives and parameters set for each, together with the differences between them and their unique features.

220. The impact of the options is discussed in Chapter 7, together with the effect of using money in slot allocation. Each option is analysed against the objectives set by the Department of Transport, and for its consistency with liberalisation policies. Where appropriate, comparisons are drawn with the attributes of the current system. We present our view of the likely effect of each on the airline industry, on the airport authorities, and on the travelling public.

221. In Chapter 8, we comment on the legal implications of both new schemes, in their meeting of British, EC and international regulations. Potential incompatibilities are noted for future consideration and action.

222. We have developed implementation strategies for each of the two new systems, and these are set out in Chapter 9. They are intended to enable both industry and

regulators to experience a smooth transition from the present system to a fully mature new one.

223. In Chapter 10, we describe in practical terms what the operation of each of the two new systems would mean to an airline. Because both represent a significant departure from current practice, their mechanisms are described in detail in diagrammatic form so that the actions required by airlines can be readily understood.

224. Chapter 11 describes what we have identified as critical sensitivities, those issues and areas of concern which must be resolved if one or other option is to succeed.

225. Future actions necessary are identified in Chapter 12. If either option is selected for implementation, a clear programme of actions by Government will be necessary, and these and the justification for them are presented here.

226. The overall conclusions of and recommendations from the study are presented in Chapter 13, and are followed by a list of References and a Glossary. The report is supported by six annexes. Annexes A and B contain detailed descriptions of the Regulatory and Market Hybrid options. Annex C has a detailed development of our concept of fields, and develops the rationale for the specific fields which we have identified as necessary for the two options to work. Annex D has the Terms of Reference for the study, and Annex E the composition of the Study Steering Group. The plan for the Stage Two study is presented at Annex F.

3. THE CURRENT SYSTEM

INTRODUCTION

301. Much has been written on the current (May 1991) system of slot allocation, which is well known and operates under the IATA Scheduling Procedures Guidelines (reference 1). This section is not intended to be another exhaustive treatment; only points relevant to this study will be discussed.

OPERATION

302. The present system is officially a non-pricing system where the principal mechanism for allocating slots is in the hands of the incumbent 'grandfathers'. They exercise their rights in a relatively free but closed door trading (non monetary swapping) environment with minimal slot sacrifice provisions. The historical right to a slot is essentially preserved through its continuous use. Provisions for new entrants have been developed over time, and in principle now give some priority to new participants at congested airports when the grandfathers have been satisfied. The first formal status of 'new entrant' was introduced by IATA in July 1990 (reference 1). The EC's block exemption relating to slot allocation and airport scheduling, which took effect from February 1991, embraced the IATA definition of a new entrant, and introduced an additional category, but stopped short of requiring slots to be expropriated. The EC's proposal for a Regulation on common rules for the allocation of slots at Community airports, published in January 1991, incorporates these definitions of new entrants, and would require Member States to intervene in the allocation process, by reclaiming slots for incumbents, under certain circumstances (reference 2).

303. IATA and non-IATA airlines (worldwide) meet twice a year (June and November) to "provide a forum for the reaching of consensus" on the scheduling and coordination of winter and summer season airline flight programmes. Each airport or group of airports has a coordinator drawn from the industry and usually working directly for his country's Transport Department. The airport coordinators play a crucial role in allocating arrival and departure slots within the established capacity limitations (ATC, runway, apron, terminal facilities, etc) following the guidelines and priorities set up by governments, the national aviation and airport authorities, the scheduling committees, the EC, and IATA.

304. The specific coordinator's roles and responsibilities in the UK slot allocation system (reference 3) follow IATA procedures and consist of:

- organisation of the coordination of methods and procedures.
- advising airlines on scheduling constraints.
- negotiation for improvements in capacity.
- optimisation of the allocation of slots.
- coordination and liaison with IATA.
- publication of data on request.
- organisation of regular capacity review meetings.
- calling of general consultative meetings on scheduling.
- avoidance of discrimination in slot allocation.
- maintaining position of equal responsibility to all parties.
- total responsibility in allocating slots.

305. The roles and responsibilities of the Scheduling Committees include, among others:

- overseeing the work of the coordinator.
- consultation with authorities on capacity levels.
- determination of local policy and guidelines.
- representation of operators' views.
- functioning as an appeal body against coordinator's decisions.
- election of the coordinator.

It is important to note that the committee is not responsible for slot allocation; this is the coordinator's role.

306. The slot allocation process is in fact a continuum of activities throughout the year which contains the following essential steps:

- the determination and agreement on terminal and runway capacities.
- the consideration of airline submissions ('raw demand').
- the coordination of the demand within the capacities.
- the IATA scheduling conference, the most visible part, where feedback to airlines and coordination takes place in an open forum.
- the approval and the registering of slot swapping between airlines.

- the constant schedule changes which will follow till the beginning of the actual flights.

ADVANTAGES OF THE PRESENT SYSTEM

Proven Acceptability

307. The present system has been in operation and has evolved since 1947 and is well accepted throughout the international airline industry, and with national aviation and airport authorities. The IATA system has served the international airline community well during that time. The complexities of planning and coordinating millions of flights six months in advance at hundreds of airports throughout the world have been mastered by the hundreds of airline schedulers and planners who meet regularly only to produce working flight schedules in accordance with airlines' plans. The system works on a voluntary basis and has overall achieved an enviable record of efficiency. However, it is a labour intensive process, with a relatively unsophisticated transaction system and mechanism compared to, say, a modern fully automated stock exchange system which is able to value, track, monitor and perform billions of worldwide share transactions on a continuous basis.

308. During our necessarily limited exposure to the current system and its players, we have formed the view that the historical precedence rule means that the majority of incumbent carriers leave the planning conferences with most of their schedule requests satisfied. A typical breakdown of slot requests at a congested airport for the winter season might include 75% historical slots, 15% marginal changes for operational optimisation of airlines' schedule, and 10% new slots. At uncongested airports, the turnover of slots is two or three times as high. All historical flights are likely to be granted. The changes create a problem: some of the slots will be swapped and optimised for airline use at the conference itself; others will have to be finalised by the continuous scheduling process between airlines and airport coordinators which takes place between the end of the conference and the start of the season. The new slot requests have become a real problem, especially at the congested airports. Depending on the nature of the operator and the airport coordinator's decisions, partial success or total failure to meet airline's additional requirements will characterise the transaction. The summer schedules are much more difficult to satisfy, but the same principles hold.

309. Some charter operators, who tend to change their schedules more often to follow the holiday traffic, are known to leave the conference with less than half of their

additional (new or different from last season) slot requests satisfied. This shows that despite the high success rate achieved by airlines that need to change very little in their year by year schedules, the system is less able to satisfy new demands. This inability has, on occasions, been the source of friction. The recent slackening of traffic demand has, however, given the system some additional manoeuvring room. This point will be expanded upon later when examining the flexibility of the system.

Minimal Cost of Operation

310. The costs to operate the present system are difficult to assess precisely. The labour intensive nature of the operation has already been indicated. We suggest that given its importance it still is a relatively small cost to bear by airlines as a group compared with their financial turnover. A rough order of magnitude suggests overall expenses around £6-10 million a year for two scheduling conferences, including staff, travel, accommodation, hardware and maintenance costs for the airlines and airport scheduling committees. Assuming 200 companies or agencies, this represents up to £50,000 per year for each involved in the scheduling process. Some parties spend much more.

Flexibility to Change

311. The IATA process has shown itself over the years to be capable of adapting to new circumstances, though not necessarily always to the satisfaction of all the parties involved. The system has evolved and now includes non-IATA carriers. Newcomers are offered formal briefing sessions. A lot of effort is spent by IATA to combat the accusations of cartel which are made at the organisation, and the organisation has as a priority the full transparency of proceedings, negotiations and all other activities. No money and no lawyers are, in theory, necessary or present in today's operation. The operational priorities, and the stated desire to keep regulators and governments out of the planning exercise, have driven most scheduling activities to date. Due to increasing market pressures at congested airports, IATA guidelines have been amended to make room to new entrants in a formal manner in 1990, and we have noted the new EC conditions that have recently been imposed on the operation of the IATA procedures in that area. IATA is very aware of the congestion problem and is trying hard to accommodate new players while keeping the historic rights of incumbents. Some carriers have been successful in obtaining new slots, others have not. Not all parties are satisfied with the present level of flexibility allowed by keeping to grandfather rights. IATA is "opposed in principle to the imposition of traffic distribution rules on the grounds that they may be anticompetitive and are arbitrary" (reference 1, p 2).

312. Recent statistics (reference 4) illustrate the added flexibility that has recently characterised the heavily congested London Heathrow environment following the relaxation of the Traffic Distribution Rules (TDRs). This is partially due to the slackening of air traffic demand and economic conditions. Fourteen new entrants have been allocated slots for the summer 1991 season out of Heathrow. They include large and small, scheduled, charter, EC and international carriers. Significant practical problems in terms of timing and number of slots still have to be resolved for some of those carriers before they start operations. Some other carriers have actually been offered slots but have not yet accepted them, probably because of the mismatch between their request and what has been offered. Opportunities nevertheless materialize, however limited they may be.

313. For the winter 1991 season (reference 5), nine more new entrants are offered slots out of Heathrow. Out of the historic slot base of 154,426 at Heathrow held by 70 airlines, 21 of the carriers requested fewer than their historic entitlement, releasing 1281 single slots. This represents 0.8% for that season and illustrates the actual extent of the margin (relatively small) for expansion at one of the most critical airports in the world. Very strenuous efforts to open up the airport to newcomers have been made. Flexibility, although limited, is a real feature of the IATA system, within the grandfather rights rules.

DISADVANTAGES

Lack of Competition

314. The major disadvantage of the present system is that it inhibits competition from airlines which cannot easily obtain access to slots at congested airports if they do not have historical rights. Those who do are free to use their scarce slots inefficiently and hoard slots. They can do this, to maintain their grandfather rights, by using smaller aircraft and/or carrying uneconomical passenger loads. While there is a medium to long term economic penalty inherent in the present system when incumbents keep operating flights below profitable levels, they have no incentive to release slots to carriers which might be more efficient, or have an alternative use for them better suited to the air transport user. This has led to the ‘freezing’ of the market place at certain congested airports, despite all attempts to open them up. The US domestic scene is full of such examples, compounded by the ownership of major terminal facilities by specific dominant carriers and the buy-and-sell rule which has allowed them to consolidate and control (now through sub-leasing) their bought slot holdings.

Overbooking (Planning)

315. Charter carriers of some nations routinely overbook slots at the scheduling conferences because of the nature of their present business practices with their tour operators. This does not happen with charter operators of other nations, due to the different nature of their relationship with their travel industries. Such abuses are widely recognised and known, but solving the problem by penalising the airlines concerned has implications at present outside the control of the individual air carriers.

Slot Wastage (Planning)

316. Slots can be wasted through the existing slot allocation system. Most carriers are diligent in notifying the airport coordinators of changes in plan, and cancel unnecessary slots, particularly when they know they are being monitored. This allows flexibility in the arrangements and enables adjustments to airline schedules before the start of the season, following the appropriate IATA scheduling conference. There is, nevertheless, a significant number of opportunities lost in the process. No penalty is presently extracted for the 'no show' cases from the carriers until the following corresponding season (12 month cycle) when the historical right should be lost, according to IATA guidelines. No airport coordinator (we saw) mentioned confiscating slots for these reasons, ever, even at very congested airports. The present system is definitely lax in this respect, relying only upon the professional interest and voluntary compliance of parties. Very few airport coordinators have adequate monitoring systems, (automated or otherwise), in place to track actual slot usage and bookings in a formal way.

Slot Wastage (Operational)

317. Existing statistics on actual slot usage versus bookings [references 6 and 7] reveal some inefficiencies (4 -6%) and waste of opportunity for some ad hoc users. There is some dynamic management of 'opportunity' slots on a day-to-day basis, but it is generally not presently performed in an optimum manner and is certainly not applied systematically throughout Europe within the present IATA system. Maximum utilisation of airport capacity is not achieved. Some airports have no set procedure to advertise formally, to notify potential ad hoc users, and to allocate efficiently slots which are to be unused for some reason (cancellation, etc). The German scheduling coordinator is tracking slot usage in a systematic process aided by a purpose built software tool. Neither BAA plc nor the British coordinators presently have a comparable tracking or monitoring system. Usage in the UK airports is checked once a season by monitoring

flight activities for one (specified) week. Recent attempts by the British coordinators to vary the week without warning have been met with protests. There is no systematic and reliable monitoring of slot usage carried out continuously in the UK today, and this applies also throughout the majority of European Community airports.

Lack of Standard Airport Capacity Standards

318. A summary look at the methods and techniques used for the establishment of airport capacities revealed a large diversity (worldwide) in the approaches used by various airport, ATC and aviation authorities to provide airport coordinators with final capacity values. These are driving the entire slot allocation process. It is recognised that this is an issue outside the scope of the present study, which takes the capacity numbers as a given, regardless of how they were derived. IATA has identified potential improvements to be made in this area and is actively working to standardise procedures. The lack of transparency and conflicting objectives of professional interests (eg air traffic controllers, airports) and political forces (eg airports, governments) add another element of uncertainty and subjectivity to the system. Short and medium term capacity improvements will result from those efforts in conjunction with airport authorities which are concerned to achieve a better utilisation of existing and scarce resources. Even in the UK, the CAA and BAA plc have not the same view of what London Heathrow can accommodate. Slot allocation as an issue is being used in many instances to hide these basic capacity anomalies.

CHANGES AHEAD

European Commission

319. As already noted, the EC's concern at the lack of competition at certain congested airports has already caused it to intervene. The current block exemption grants priority to categories of 'new entrant', and the removal of the block exemption from anti-cartel regulations is a threat the EC can employ to impose changes on the IATA system. The EC has proposed a code of conduct with provisions for "new entrants" which would require a Member State to withdraw incumbents' grandfather rights if necessary to create new opportunities. A new entrant is defined by the EC as an air carrier holding no more than three slots on any day at a coordinated airport and requesting further slots fore services on that day, or a carrier not holding more than 30% of all slots on a day at an airport or at other airports in the same airport system and requesting slots for certain intra-EC routes on that day (reference 2, Article 2(b)). Our study has shown that

incumbent airlines are correct to fear the commercial consequence of this proposal because of the potential fragmentation of their present market position, intended to offer new opportunities to new players but with no guaranteed effect of improved consumer (traveller) efficiency or convenience.

320. The proposed Regulation would be binding and directly applicable in all Member States. It contains a provision that its operation should be reviewed before 1 July 1994. Our limited contacts with airport coordinators have shown mixed reactions to the draft Regulation. The block exemption provisions, which took effect in February 1991, appear to be being implemented unevenly, with some coordinators welcoming the existence of clear provisions for new entrants and applying them, but others only operating the IATA definition. Although some coordinators operate under the direct control of their government's policy branch, most have a lot of discretionary power. There is not currently a universal (worldwide) application of the same rules by all airport coordinators on all aspects of the combined IATA and EC provisions. The system is at present clearly in a state of transition. The overt confiscation of a slot by an airport coordinator (under pressure or not from whatever source) may bring about legal proceedings by the targeted airline and may send shock waves through the airport coordinator community, with consequences that cannot be predicted.

IATA

321. We know IATA keeps constantly working to improve opportunities for newcomers, and is opposed in principle to any specification of a maximum percentage level of slot holdings. The relatively lax 'use it or lose it' rules are currently being revised and will be tightened to improve operational efficiency and compliance. IATA is also working to improve the airport coordinators' support and decision making systems. New standards for automated systems are being examined in working groups, but no uniformity exists at present. Most airport coordination bodies have developed their own customised software/hardware system to suit their specific needs, even though all are driven by the same operational requirement. The level of sophistication achieved by some systems is outstanding. Some commonality of systems has happened through sales between entities, but no integrated specifications, standards or equipment are presently available on an international basis.

322. IATA spends a significant effort attempting to accommodate new entrants within the existing structure, but they will not compromise on the principle of grandfather rights. We have been told that some new entrants suffer from not being aware of or

familiar with the procedures, and others of the level of authority needed to perform efficiently in the conferences. A delegate with no authority to decide on the spot is at a real disadvantage compared to the majority who have that executive power. In addition, the club mentality and the apparent closeness of conference members could be seen as a real obstacle to ambitious newcomers who do not fit the profile of the established participants. To succeed at a conference, you must be an experienced scheduler or planner in an airline who knows how to make the system work for you.

DIFFICULTIES SEEN IN CHANGING THE PRESENT SYSTEM

Introduction

323. As we have seen, the world wide application of slot allocation may not be uniform, it may have a number of anomalies, and it may be under stress because it is having to deal with increasing congestion, but it has been developed over a long period and is now an established and sophisticated system. As such, it will be difficult to change. Changes must be introduced with care and to a coordinated programme.

324. Resistance to change comes from both the operators and the policymakers. We have found these reservations in equal quantity in the limited subset of both the industry and among the authorities which we have been able to interview during both the study stages. In order to set the scene for the slot allocation process which we have used, the options we have constructed and the implementation strategies which we believe will have to be adopted, these reservations have to be described and explained. In the end they must either be refuted or addressed in any proposal which changes the current system. The more radical the change, the more attention must be paid to informed conservative opinion.

325. The difficulties can be divided into those concerning the environment of the commercial operation today, and the political background against which this operation takes place.

The Diverse Environment

326. Being a world-wide industry, air transport has to be able to operate using the whole range of management skills, cultural characteristics and technological aids for the organisation of slot allocation. In some countries it cannot rely on the fast reaction of people with the delegated authority to make decisions. In some it cannot rely on the

judgement of local managers. In others it cannot even rely on the integrity of the officials to act without personal or political bias. Any change has to be shown to be able to cope with this diversity as well as does the current system.

327. It is relatively easy to construct an allocation system if one can rely on a sophisticated set of modelling, trading and recording tools, operated by skilled, motivated practitioners, free from political pressure and bias. It is a different matter to allow for fundamental faults in the application of the system, while at the same time putting in place the tools to encourage the less sophisticated to improve their performance.

The Historical Precedent

328. Change is also inhibited by the history of the individual elements of the current system. There is a wide variation. Slot allocation between airlines dates back to the 1920s; KLM has been flying into London since 1926. The IATA forum for the coordination of schedules world-wide was created in 1947, and the scheduling mechanism is well established. The granting of grandfather rights and free trading practices have been with airlines for decades. The recent difficulties have only manifested themselves under congestion and saturation conditions.

329. On the other hand, slot sacrifice provisions are very recent. New entrants' regulations were formally published by IATA in 1990. Governments have intervened when it has been seen that policy is being frustrated. In the UK there was intervention when BA took over BCal, with the former being forced to shed routes and slots. Recently BA has been forced to reduce its service frequency on its Tokyo route, and hence its use of slots at Narita. In the USA the FAA resorted to a one-time withdrawal of slots from major carriers in 1986 at three airports to form a pool of 5% for new entrants. The tensions caused by these administrative measures are considerable and are being exacerbated by the initiatives from the EC to impose conditions on the IATA system for new entrants.

330. The mixed history of the elements makes it difficult to change them individually. A coherent approach has to be adopted to the analysis of the current system, the identification of its current problems, the construction of a modified system, and the implementation of a transition plan. Without these, it is our view that attempts to change it will fail.

Commercial Objections to Change

331. The current system has produced sets of winners and losers. The winners are those who have either obtained patronage in the past and retained the advantage, or those who have exploited their knowledge of the current system to their, perfectly legitimate, commercial advantage. Both these categories of winners see any change as a potential threat to their position.

332. The retention of grandfather rights to slots and resistance to any sacrifice proposals is the cornerstone of the winners' resistance. They correctly see these rights as a protection against unfair bias by disreputable rivals who may be supported by their officials. They have some justification for claiming that these rights provide essential stability in a chaotic commercial world, but they are on very poor ground when they claim a moral and legal right to this inheritance.

333. It is more difficult for the airlines to deploy fundamental arguments against the introduction of money into slot allocation. Without exception though, the limited sample of airlines interviewed claimed that the use of money would allow some other party to overwhelm them by outbidding them for key slots. They would be driven out of business and the net effect would be that fares would rise and traffic would fall; the solution to the congestion problem, in fact. It is clear, however, that money is entering the equation in greater and greater quantities, either overtly or through secondary considerations during the slot swapping process. The purchase of the Heathrow rights by US airlines and the amounts being offered for whole airlines shows that the value of the grandfather rights are key to the valuation of goodwill in the selling package.

334. What is also clear is that a system which introduces money must protect airlines against any non-commercial political subsidy of their competitors. This is one reason why we have introduced the concept of slot fields, which are explained in Chapter 5. We believe that any system which does not differentiate the market by some such mechanism must be commercially unsound.

335. There are of course a number of well established carriers who see the introduction of a money option, with the relaxation of regulation, as a great opportunity. It is these airlines that we should look to if we wish to refine the models which might tell us who would be the new generation of winners under a money-based option. Losers under the current system would not necessarily win under a revised system. Some are looking for changes which will give them a commercial advantage over their rivals. The EC

proposals attempting to introduce competition at the route level is an example of this type of detailed intervention. We have avoided this. We consider that all intervention should be at the highest level necessary to carry through the policy objectives of the administration. In the case of slot allocation, the limitation should be to give businesses the right to enter the arena; it should not give them the right to privileged access to any particular part of the market.

336. Those airlines which depend on bilateral agreements, and the support of their governments to maintain these, are unlikely to look on change with equanimity. We will suggest later that new allocation options should be constructed so that airlines are motivated to leave their bilateral fields and enter the free market of the EC field. This will inevitably lead to the accusation that they are being disadvantaged. The only counter to this is to ensure that this disadvantage is fairly balanced against the inherent advantages they enjoy. Nevertheless, the existence of bilateral agreements is seen to be a major obstacle to change in the allocation system.

337. Deregulation of routes and other measures are part of an overall market environment. Any changes to slot allocation which attempted to control the workings of the industry at an unnecessarily detailed level would, rightly, be resisted by any current winner or loser. The fact that any new system will generate a new set of winners or losers is bound to make any change contentious. All can be accused of special pleading, and mainly this will be a justified accusation. In general, we contend that new options can be made to work if they are kept consistent within themselves and are implemented intelligently.

Political Difficulties in Changing

338. Most of the political objections to change are based on the history of the development of the airline industry, both on the commercial and the governmental side. Most airlines outside the USA are still, or were until recently, a direct arm of government policy. They are used to a close relationship with officials. This has made them fearful of change and the exposure to the full blast of commercial pressures. They cannot conceive how paying for slots could generate efficiencies to compensate for their extra costs.

339. At the same time, this experience has made them cherish the independence that the IATA sponsored slot allocation system has given them. It has become clear to us that they do not accept that, as congestion increases the value of the grandfather rights,

some methods have to be found to control the build up of monopoly power based on these monopoly rents. Very few commodity markets are allowed to operate over a long period without regulation. We have seen nothing in the slot market which causes us to think that it is unique in this respect. In the end it will become subject to law rather than to consent, reinforced by a random set of bilateral agreements, many of which will become irrelevant as the EC becomes increasingly integrated.

340. The history of airports is almost identical to that of airlines. They have been within the government orbit and have been fully regulated. Today they are regulated as the gifted monopolies that they are. International agreements also exist to prevent them exploiting this monopoly against foreign carriers, recognising that it is, in fact, governments who generally create the monopoly situation at airports by restricting both the supply and the level of charges. Of course governments are under pressure from a wide lobby not to build airports.

341. It can be argued that these international agreements are at the core of the difficulties which might arise in the implementation of any money based option. The Chicago Convention demands that charges should be fair and reasonable, non discriminatory and fully allocatable. The use of the single till means that the income of an airport must be considered as a whole. The effect of this is that the landing charges at Heathrow only recover something like two thirds of the cost of providing the runway and terminal facilities. The rest comes from shops and concessions.

342. With the benefit of hindsight, an opportunity may have been missed when the British Airports Authority was privatised. If the shops had been sold away as a separate company, BAA (Runway) plc, to maintain a realistic level of equity and debt, could have raised the landing charges almost to the level we suggest that rents would settle in the Market Hybrid option proposed later in this paper.

343. The change to the money option is further inhibited by the assumption in the Terms of Reference for Stage Two of the study that the proceeds of the auction should be taxed away. This is in effect the government acting as the classic monopolist. In the free market, the monopoly rents would attract capital to construct more facilities to extract some of this rent, the effect of which is to increase supply and moderate the monopoly rent levels overall. This proposal to tax away proceeds has no commercial logic and may invite action under the Chicago Convention. This would be easier to counter if the income from the auctions were to be fed back to the source. A direct repayment to the airlines for each passenger, or even a payment to each passenger is

likely to be favoured, as might investment in intra-airport facilities, but the line is likely to be drawn well short of general taxation.

344. The inhibitions to change caused by these historic bilateral agreements and historic conventions of airport management should be studied in more detail if the Market Hybrid option is found to be attractive in other respects.

Current Policy Issues

345. Governments are also inhibited by the history of their involvement in the industry. In the US, the gifting of the money rights to the grandfathers, the lack of control of trading, and the lack of effective sacrifice rules have produced a reinforced monopoly at many of the congested airports. US authorities now seem to be contemplating moves to recover the situation. The precedent of the fully free market is now making it more difficult to impose the necessary regulations than would have been the case if a controlled programme had been instituted. A more gradual move towards achieving a free market might have been better, but with regular reviews to check progress and put in place appropriate checks and balances as their need was identified.

346. In much of the rest of the world, officials come from the same background as the airline and airport management. Indeed many of them are still under remit to manage many of the details of air operation in a ‘hands on’ mode. We have found that some are having difficulty in letting go the reins of this control; they are not convinced that the industry is able to manage itself. In this they are encouraged by what they see happening in the USA, and by the complaints of losers that the current system is one set up by the winners to maintain their inherited advantages.

347. These officials tend to the view that the only solution is the imposition of more administration. Some are not prepared to consider the use of money. We had evidence that officials had been instructed not to talk to us on the subject. The system is very sophisticated and needs the collaboration of all levels of the administration. We believe that this reluctance to collaborate could be a major problem in making radical changes to the current system.

348. Within the EC there are attempts to increase competition by introducing measures at the detailed level of individual routes. This is in effect the enforced substitution of one operator by another. This is highly administrative. We feel that the emphasis should be

on ensuring that all EC airlines operate in the same competitive environment. They can then be left to compete in a fairly liberal local environment.

349. The EC proposal that foreign airlines should only be allowed to operate freely within the EC if they can prove that their sponsor operates full reciprocity, is considered most constructive. We have based our concept of the EC slot fields around the assumption that there is the political will to carry this concept through. It may be that the EC will have the power to negotiate away many of the bilateral agreements which will inhibit the introduction of radical changes to the slot allocation system. It has certainly shown its determination to impose its will on IATA by invoking the threat of withdrawal of the block exemption to the cartel regulation should IATA not change the current system.

4. SLOT ALLOCATION EXAMINED

INTRODUCTION

401. Inevitably, the balance of this report goes heavily into detail on the mechanics of slot allocation. The purpose of this chapter is to introduce the concepts and terms that will be used later, and to explain the ideas behind our approach to the problem of developing new slot allocation systems which will work successfully and in a predictable way.

402. Like any other system, slot allocation has elements that make it up. The performance of the system is dependent on the characteristics of these elements, how they behave and interact, how they respond to change and to outside factors. Change one element and you change the system and its behaviour and its effect. This may seem obvious, but we have been surprised during this study to have seen changes recommended to slot allocation issues when apparently no formal analysis has been made of their overall effect on the system they make up. Our systems approach was taken to try to avoid this pitfall. Systems architecture is similar to conventional architecture; a successful system is like a successful house. We need to design them to please, in different ways, the occupants (the airlines), the passers by (the air transport users) and the local authorities (governments etc). They must not blow over in the first gale (be robust to policy changes), and they must be adaptable as the demands of the family change (changing market conditions). The analogies can be taken too far, but the fundamental point is that new slot allocation methods are about architecture, not about advocating new designs of brick.

PURPOSE OF SLOT ALLOCATION

403. Slot allocation originally existed to match demand with supply. When supply handsomely exceeds demand, there exists only the trivial problem of management. But the problem gets progressively more difficult as the ratio nears equality and reverses. Why should the ratio change? In most other spheres, markets take care of supply and demand. The requirement for more slots signals the need to build another runway. Unfortunately, in the case of this particular issue, a whole host of political, economic and physical factors inhibit the necessary supply. So efforts must be directed at matching supply with demand as far as possible while meeting the stated objectives of government policy. The Terms of Reference note the objectives of any slot allocation system as:

- to further the reasonable interests of air transport users.

- to increase the scope for and likelihood of airline competition.

- to reduce rigidities in the system so as to enable slots to be used more efficiently.

- to give a degree of protection to smaller airlines.

This illustrates how far the influence of policy has removed the problem from the simple issue of permitting access to a runway at about 1100 hours on a Friday to someone who would like to land then.

ANALYSIS OF A SLOT ALLOCATION SYSTEM

Fundamental Parts

404. Any slot allocation system can be broken down into four fundamental parts:

- Initial Allocation.
- Trading.
- Slot Pool Creation (through Sacrifice).
- Re-allocation.

It is the possible variation in each of these parts that brings about the almost limitless permutations for a whole system. It is worth examining some of these possible variations for each part in turn. The reader will quickly think of more, and the many multiples of possibilities for any overall system will be readily apparent.

Initial Allocation

405. The initial allocation could be a gift, according to some rules, or a sale, or a lease, again according to some rules and with or without restrictions.

406. There are many possible rules for gifting. There might be no recognition of any right, and award of slots could be arbitrary and regulatory in nature. Grandfather rights, however, could be used to acknowledge past history of market forces. Other criteria

might reflect policy objectives such as traffic balance, or the wish to encourage new entrants.

407. Slots could be sold, freehold, as an initial allocation mechanism. Fixed prices with some restrictions, or highest bid with no restrictions, are just two examples of many possibilities. Slot leases, as opposed to freehold, might also be sold initially, with the lease terms and conditions affecting duration, rents, buy-back clauses, etc providing an even wider set of possibilities.

Trading

408. After allocation, possibilities for trading range from complete prohibition to open market sales. In between are swapping within categories, free swapping, sales and leases, all possibly subject to a variety of restrictions and terms. Trading might be of a slot in perpetuity, or of just one in several hours' or days' time.

409. The present system of trading within the IATA conferences is a free and straight swapping of slots between carriers. Covert money transactions do probably take place, simply because such things are possible, but there is no hard evidence. Other trades for value are possible too, with slots forming some part of a total consideration, either political or financial.

410.. In the USA, domestic slots are bought and sold but with no formal publication of the terms. The FAA keeps record only of the operators of the slot and its characteristics. A substantial sub-leasing of slots has been developed by the US grandfathers, who were gifted most of their historical slot holdings.

411. Some airlines are known to favour secondary trading of slots gifted to them as grandfathers. The process would be very similar to the post IATA conference swapping that takes place now to optimise and smooth schedules, only with the use of money to escape the need to swap and to recognise the different values of the slots traded.

Slot Pool Creation

412. The pool of slots for new and different users can become available through three primary means:

- voluntary relinquishing of slots by airlines, natural attrition due to operational changes, business failures etc.

- confiscation of slots not used for their intended purpose under a set of 'use it or lose it' provisions.

- a forced sacrifice, specified by regulation.

413. Again, sacrifice provisions can vary from complete airline freedom (no sacrifice), with the inherent danger of monopolistic behaviour and no access opportunities for new entrants, to very rigid regulatory measures which do not reflect natural market forces.

414. Between the two extremes lies a variety of potential sacrifice schemes and provisions. One is the lottery, which introduces an element of randomness into the market place and is sometimes seen as a substitute for fairness when the latter is deemed impossible to achieve by policy or decision makers. Other sacrifice provisions can be based on market share (actual or planned). Airlines could decide themselves which slots (if any) to relinquish, as they do today. Non-use rules can be designed, and are currently of varying degrees of severity. An existing 'use it or lose it' provision in the US system is 'under 65% use in two months'. The FAA is presently reconsidering the rule, which is seen as too lax. As we have seen, IATA rules are based on the principle of historical precedence and usage. A slot not used is lost for the next corresponding season (12 month cycle).

415. Where bilateral agreements provide for replacement carriers to be nominated when rights are not taken up by those designated, the extended period before these provisions are invoked inevitably permits inefficiencies in the use of scarce slots.

416. Sacrifice provisions are extremely controversial. They are adamantly opposed by IATA airlines who believe they depend on their grandfather rights for economic survival. Withdrawal of existing slots has occasionally been carried out by British government authorities. One example is the recent imposed restriction of BA services into Narita (Tokyo), with the effect that BA had to surrender slots at Narita to match their reduced level of services. An earlier decision led to the withdrawal of slots from BA at Gatwick when the airline merged with BCal. Precedents have thus been made, but they were

clearly more of a 'one time' administrative nature than a recurring practice. The US Government has also occasionally taken slots away from US domestic carriers to satisfy international agreements, a fact which reveals the priorities of the US DOT.

417. The EC has also proposed a controversial proposal that slots could be withdrawn by Member States under certain circumstances if the need to foster competition warrants it. Since a carrier holding more than 30% of slots at an airport could not claim new entrant status, and since carriers with more than six slots on a route on any day could have slots withdrawn, some airlines, especially the larger ones, feel very vulnerable in the face of the EC's proposals. Such a rule could have a significant effect on the airlines' strategic plans.

Re-allocation

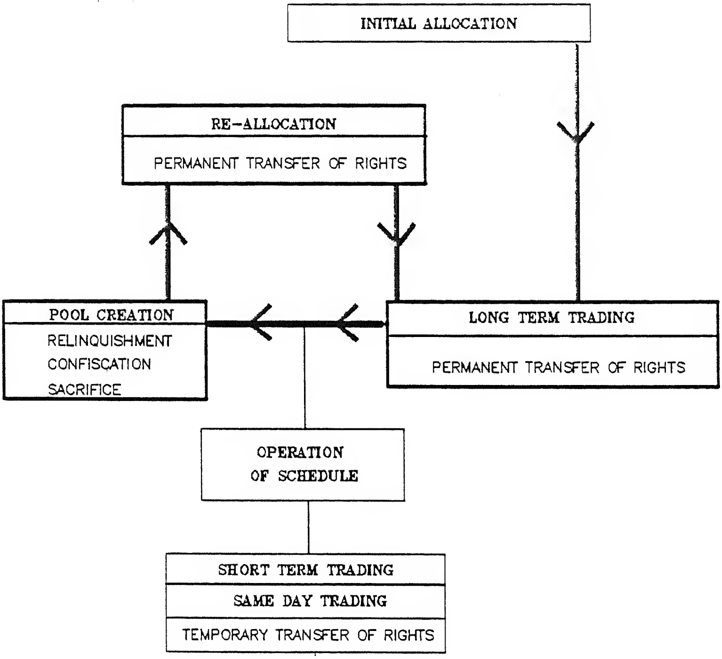
418. The re-allocation of slots from the slot pool (on a recurring basis) is affected by the same considerations as in the section on initial allocation, except that different airlines would benefit.

The System in Operation

419. The relationship between the four major parts of a slot allocation system is illustrated in Figure 4.1.

420. The first step which starts the process is the initial allocation. Once slots are allocated according to one of the rules discussed earlier, the airlines can engage in trading, especially in the long term use of slots. Because of the rules for sacrifice or confiscation (none or fully regulated, whatever they may be), the incumbent airlines will either voluntarily or forcibly contribute to the creation of a slot pool, from which a re-allocation can be carried out to existing or new carriers. Those new airlines or entrants are now able to participate in long term trading. The scheduling and coordination operation functions in parallel, for all airline participants and for all slots. There is an additional trading element, for short term and same day slots, which results from the dynamic and day-to-day operational reality of the airline industry. This may not affect the long term rights to the slot.

FIGURE 4.1 FUNDAMENTAL MECHANISMS OF SLOT ALLOCATION SYSTEMS



- ONCE THE SYSTEM IS ESTABLISHED IN THE LOOP IT BECOMES A CONTINUOUS PROCESS

- AS THE ENVIRONMENT CHANGES IT IS NECESSARY TO ADAPT THE RULES OF EACH OF THE ELEMENTS

THE ADMINISTRATIVE FUNCTIONS

421. The aim of this section is to describe the general principles and structure which our analysis shows are necessary for the administration of any allocation system. In Chapter 3 we commented on the current system. This is characterised by the high expertise of the coordinators in their function of negotiating with airlines for allocation. It does reveal a wide variation in the involvement in the policy level. Some officials are semi-autonomous, while others are virtually a passive arm of their transport ministries. We consider that any system which provides greater freedom within predefined boundaries, must be administered so that the boundaries of responsibilities are clear and the procedures used are transparent to all. It does not have to be bureaucratic, just transparent. As one airline wryly pointed out, just because an allocation system displays its data to all on a large colour screen, it does not mean that political pressure does not lie behind it !

Objectives of the Administration

422. In all slot allocation systems the aim of the administration is the same. It must be able to receive, interpret and coordinate all the high level inputs from governments, the industry and the users. It must be able to set down a set of rules which allow the demand for slots to be matched with the supply. It must provide a mechanism for scheduling the slots allocated to individual airlines. Finally it must work in close cooperation with the airports and the airlines to ensure the efficient day-to-day operation of the slot allocation trading system.

423. The current system has coped well but there are indications that it is coming under pressure as congestion rises. It has been protected by a number of measures, such as priority rules, traffic distribution rules and grandfather rights. All these ease the role of the coordinator both in the quantity of transactions and in the acuteness of the arbitration.

424. Experienced coordinators put their faith in their knowledge that, in the past, more capacity has always been generated when the system seemed to be at the point of breaking down. We found clear evidence that congestion is in fact reducing the turnover of slots at congested airports to as low as a third of that at free airports. The airlines are afraid of giving up grandfather rights in an attempt to optimise their schedules in case they fail in the subsequent bid to recover them as the demand rises again.

425. The EC and several national governments are demanding a freeing of these constraints. The system is enjoying a temporary respite during the current downturn in airline activity. Airlines are demanding that if the system is to be liberalised it must be made fair to all. It is these concerns that we have attempted to address in these proposals.

The Three Tier Agency Structure

426. For the options we have been asked to construct in this stage of the study, and in accordance with the Terms of Reference, we call this administration the agency. We characterise its elements as functions. The details of the two options are in Chapter 6 and in Annexes A and B.

427. In formulating the structure for the agency we have attempted to formalise the functions into logical levels. This does not mean that we advocate a large organisation. The Regulatory option would be controlled much as the present system. What it does mean is that it would be possible to audit an administration to verify that it met a common acceptable standard. This would allow, for instance, a bilateral operator to prove that he met all the criteria to leave the bilateral field and enter the appropriate free EC field. It would also mean that there would be a basis for appeal in disputes between operators and authorities within the EC.

428. Although the responsibilities of individuals spread over a range of different functions, analysis of the current working of administrations in several countries reveals that the functions themselves fall into three distinct groups: Policy, related to Government, airports and users; Allocation, concerned with the initial distribution of slots and clusters; and Coordination, which is related to the approval of transfer of slots and schedule changes. Figure 4.2 shows these functions.

The Policy Function

429. We have a growing gap between the practitioners and the established airlines on the one hand, and the EC and some national governments on the other. There seems to be no uniform forum by which slot allocation problems can be resolved at the highest level. Some are attempting to use slots as a fundamental engine of change. Some are using them as a battleground in the fight to retain the right to self regulation in the industry. Others see them as an opportunity to attack the assumptions concerning the

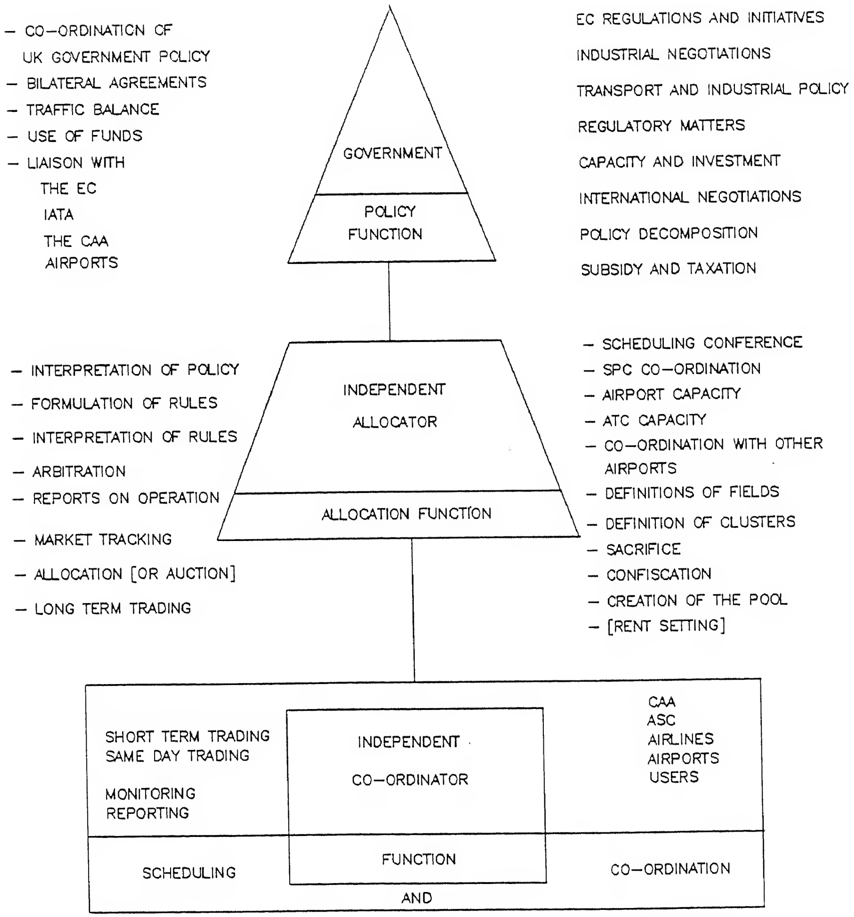


FIGURE 4.2 TYPICAL MANAGEMENT STRUCTURE OF THE ALLOCATION SYSTEM – BOTH OPTIONS

FUNCTIONS AND RELATIONSHIPS

[ ]=MARKET HYBRID

calculation of airport capacity. We feel that slot allocation requires a formal policy level at each airport, as is already incorporated in a national policy forum in some countries. This does not imply a dedicated individual for each airport, merely a separation of policy from allocation issues.

430. Figure 4.2 shows the type of activities appropriate to the Policy Function. The extra activities required by the Market Hybrid option compared with the Regulatory option are detailed in Chapter 6 and Annexes A and B. The major additional activities at the Policy level in the Market Hybrid would be the monitoring of the flow of money, the endorsement of rent levels, the various policies concerning sacrifice and confiscation, and the setting of charges for bilateral operators.

The Allocation Function

431. This function includes all the present allocation activities of the coordinators. It also includes the tasks of maintaining the usage database, a current deficiency at most airports. The extra duties would include the construction of fields, and the controlling of the rules and conduct within them. In the Market Hybrid option there would be the major task of organising the auction, gathering the slot pool and constructing the clusters. The maintenance of the trading database would also be a prime activity.

The Coordination Function

432. The day-to-day operation of coordination would be unchanged. The coordinator would still be responsible for the smooth scheduling of slots, in accordance with rules passed down from the allocation function. In the Regulatory option the two functions might be combined in one person. In the Market Hybrid option there would be the extra task of acting as broker for Short Term and Same Day Trading (these are described in Annex B). This, combined with the much greater need for recording actual usage and negotiating the acceptability of transfers using money, would require that coordination was a separate entity in this option.

Critical Elements in Agency Development

433. Although the agency functions are essentially the same whatever option is adopted, some policy issues have to resolved before embarking on the development of an agency concept.

434. The most fundamental is the use of money. If money is to be used, the setting up of the agency must be subject of special study. Stage Two of this study has excluded all economic and activity modelling. We are not able to assess either the manpower or the models which will be needed to operate an auction system. With the use of modern tools we do not believe that the organisation will be large. The initial setting up will be a major task, but this is susceptible to analysis and the practitioners are skilled. There are a lot of precedents in auctioning and trading to draw upon.

435. The next policy issue is that of self regulation. The growing conflict between IATA and the EC must be resolved. The EC is stepping into the policy vacuum left by the inaction of national governments. A decision has to be made as to whether the system is to be based on a monitored self regulation system or whether it is to be run by an official body, and whether this should be at national or EC level. Once again, if money is to be adopted it is difficult to see that a self regulatory body will be acceptable. The resolution of the 'level playing field' and bilateral issues may alone be enough to require the involvement of both the EC and national governments. This will be required at least down to the allocation function to control the activities of the allocator when he intervenes actively in the market.

436. There seems to be no reason why coordination should be subject to more control than is now exercised. As long as the terms of the slot rights (be they given or leased) are reasonably relaxed concerning timings and reasonable usage, and as long as the coordinator is given sufficient authority, we see no reason to change the current efficient system.

ACCEPTABILITY AND WORKABILITY OF NEW SLOT ALLOCATION SYSTEMS

437. A new slot allocation system must function in a practical sense. It must be robust, and not break down when circumstances change. It has to satisfy both the airlines, who can be expected to be hard to please, and the policy makers. Ideally, it should allow a smooth transition from one steady state to another.

438. Early in our work we identified and named three analysis headings which address these issues, and, as they are terms which tend to be used in the detailed analysis of the systems, they will be outlined here.

Policy Objectives

439. The political acceptability of a slot system is crucial. How this important factor might usefully be assessed was a major problem we had to solve in Stage One of the study. We used a method of identifying key policy issues and charting them, issue by issue. A side benefit of this was that it promoted a common understanding between all parties (the policymakers and ourselves) of what policy on individual issues actually is. But its main purpose was to enable us to compare the policy features of a slot allocation system with the policy it would have to satisfy. A mismatch indicates the need to reconcile the two, either by changing policy or, (more likely), re-designing the slot allocation option to have different policy characteristics.

440. An example illustrates the problem. Suppose policy is to foster free market forces and competition between airlines. Any proposal for a new slot allocation mechanism, however, has to take account of the constraints imposed by international and bilateral agreements. The policy for competition might strongly point to the need for some enforced sacrifice of slots by the airlines at congested airports, and some slot allocation proposals have done just that. But such a principle would be incompatible with the international and bilateral agreements. So, clearly, the slots used to service those agreements must be managed under a different set of rules from the others. This is what has led us to the concept of 'fields' of slots, individual sets of slots, the management of which is different. The policy of market forces and free competition can be met in some fields, not in others, and may be achievable for intra-EC services but not for others operating into the same airport. This has been the experience in the USA, where domestic and international operations into congested airports are subject to different rules. GATT negotiations notwithstanding, the world is not yet a free market, especially in air transport. Recognising the realities of this, and only the promise of eventual change, means that both policy objectives and slot allocation methods must be engineered to fit. If they cannot be, the differences must either be lived with, or one or the other abandoned.

441. In our Stage One work we spent some time identifying policy objectives and assessing the policy makers' perception of their importance. This analysis has since been reviewed and confirmed by the Department of Transport. The slot allocation methods that have been developed in this Stage Two work are consistent with those confirmed policy objectives. Obviously they will have to be reassessed for an EC-wide system.

Tension

442. In our Stage One work, we put forward our view as to why allocation systems sometimes broke down when circumstances changed; it was for a lack of fundamental philosophy, or overall strategy. We identified the strategic characteristic which was core to the issue of slot allocation, and it was market forces. We saw different interests amongst policy makers, airlines and users pulling in different directions, some wanting tight regulation, others advocating a free market. Some demanded different characteristics in different parts. One example was 'free competition for me but protection from powerful rivals'. Another was 'free competition but the right to fine tune the industry'. It was clear to us that one slot allocation system could not be all things. One has to decide what it is that we are trying to achieve in market terms by a specific slot allocation method (the strategy), and then the individual features that made up the method have to be designed to fit. In Stage One, with no specific brief as to the market strategy to be achieved, we designed in outline four new slot allocation methods, ranging from highly regulated to free market. All had inbuilt constraints and features to enable them to match the declared policy objectives.

443. It is the inbuilt constraints, however, which give the problem. Our experience is that elements of a management system that do not accord with its overall philosophy will bring it down. So each part of a proposed slot allocation method has to be consistent with its overall intent. If it is not, that part is said to contribute **tension** within the system, making its working uneasy. It is this need for consistency across a particular allocation system that drives down the number of feasible slot allocation options from the many thousands which initially seem possible. A highly regulated system, but with money changing hands somewhere, just will not work, just as a supposedly free market system with rigid traffic distribution rules will break down too. All the elements of a potentially successful slot allocation system have to contribute to its overall philosophy. Where some cannot, because of legal or other constraints, their effort must be clearly understood and, if possible, balanced by other factors. The detailed workings of these slot allocation system designs are not appropriate for this report; they will be found in supporting papers.

System Dynamics

444. The third topic to be considered in the design of a new slot allocation method we called **system dynamics.** In the way that electromechanical systems have a designed predictability of operation, so those developed here can be constructed to produce

robust and stable characteristics. Remembering the stability enjoyed by a pea inside a cup, it is the design of the cup that is important, not the pea. And the cup offers no stability to the pea upside down, it has to be used in the intended manner. So it is instructive to examine each part of a slot allocation system and identify what, in system terms, it is designed to achieve.

445. *Allocation* - Allocation should operate under a series of pre-advertised rules, the principles of which remain unchanged for a long time. Any modification to the ways these rules are applied should also be made against a set of pre-advertised parameters. Thus the market knows where it stands, and airlines can make their long term plans accordingly.

446. *Trading* - Trading provides the means by which everyone can assess the supply, demand, scarcity and value (if money is involved) of slots. Trading should be unconstrained as possible, but with the true nature of any transaction clear for all participants to see and understand. We see trading, in whatever form it takes, as the primary mechanism for tracking the market in slots.

447. *Sacrifice* - Sacrifice should be used to adapt the system to changes in market conditions or other external factors for which the market cannot be prepared. It is currently seen as a mechanism to allow new entrants, but it need not be just that. As with the other two parts, sacrifice should operate to a set of clear rules, and the philosophy behind them and the consequent basis for ever changing them must also be publicised.

Other System Characteristics

448. There are other features of slot allocation systems which are necessary for assurance of a detailed system design. These include the predictability of the airlines' and other players' reaction to the rules; how the regulators may react to the results; how good the market information which is made available and how quickly is it used; how stable is the market when the rules are stable; and how stable are the rules.

449. Any market will learn to operate (or circumvent) any system. What we have done is to develop new slot allocation methods which will, we believe, operate in a predictable way in accordance with a market philosophy and in a manner consistent with a set of policy objectives. But they cannot be tinkered with indiscriminately without putting them through a full analysis to see how they meet the criteria for policy support, low internal

tension and performance as a system. This is not an academic exercise; it is an essential practical working set of assessment tools.

SLOTS, CLUSTERS AND FIELDS

450. Slots, clusters and fields were defined and introduced in paragraphs 209-211. Here we expand on the concepts and indicate the numbers of each in a slot allocation system at an airport. Fields are covered in detail in Chapter 5.

Slots

451. A slot is the approval to use a runway for a single movement, either a take off or a landing, at a certain time on a particular day. This definition is based on the concept used by the British airport scheduling committees (reference 3) and in accordance with the guidelines established by IATA (reference 1).

452. To the airport scheduling authorities, and to the airlines, allocated slots are for planning (coordination) purposes only and take account of constraints imposed by ATC and airport facilities. The actual 'on the day' slot is an operational event which is managed tactically according to the realities of the day. Allocated slots, according to the IATA guidelines, are specified to a time window of at least 10 minutes. In practice, British coordinators specify 15 minutes. This latitude is a practical allowance for the effects of weather, flight time variation, air traffic control and technical delay. The actual 'on the day' slot time will need to recognise the real cumulative effect of these factors, and the actual practical constraints of aprons, gates and passenger facilities within the terminals, extending even to surface transport access.

453. In reality it is often these latter issues which can largely dictate the declared slot capacity of the airport, which is expressed in movements per hour. Within the overall limit there may be restrictions on the number of large aircraft, or the number of aircraft wishing to use a particular terminal. The airport authorities, ATC and the coordinators are all involved in deciding this capacity; the airlines contribute by specifying the size of aircraft they propose to use. The planning (coordination) slot by definition acknowledges all these constraints, and is approved by the coordinator.

Clusters

454. A cluster is a package of slots reflecting the operational and commercial requirements of airlines. With the current allocation system, the grandfathers have developed clusters of slots which meet their requirements. An intensive shuttle service may need 30 slots, 15 landings and 15 take offs per day at an airport; a short haul service may need 12 per day from an airport; a long haul service anything from two per day to two per week. Slots are generally paired for landing and take-off, but single slots may be needed for engineering and repositioning.

455. When airlines bid to the coordinator at the start of each season, they ask for a variety of combinations. These vary from the same time each day of the week for the whole period, to the irregular supply for a restricted period. Their bids match the demands of their particular operation. The current IATA procedures favour regular services, and it is these which the coordinator serves first. Lower priority requests are dealt with if the capacity remains and there is room to fit the particular sequence into the patterns.

456. If money became part of the slot allocation system, the value of a slot would largely be determined by its potential use. It can be argued that in a perfectly free market the slots should be sold individually and the after market left to sort out the logical assembly of workable sets. Study of the current system in operation, however, has convinced us that the simultaneous introduction of auctions, together with the effective dismantling of today's slot management methods, would cause intolerable strains on the system. The airlines have to be able to construct complex networks involving non-EC and congested airports. At least initially, it is likely that allocation mechanisms such as auctions will have to contain a number of lots which are pre-clustered slots. The nature of these clusters has to be considered.

The Scale of The Cluster Numbers Problem

457. Over the seven month summer season the current effective maximum capacity at London Heathrow is about 250,000 single slots. Our market hybrid option will suggest that, in order to get all the slots into the market in 5 years, 20% of these would be placed on the market at the start of each season. This would imply that about 50,000 slots would be auctioned. This is not very different from the 10-20% of slots which currently are moved between operators during the current bi-annual IATA scheduling coordination

conference, but the open buying and selling of slots is a more precise exercise than the closed one for swapping between airlines which is the current exchange mechanism.

458. Our observation of the IATA scheduling conference for the winter 1991 season reveals that currently about 75% of the overall demand is matched by the coordinators by the start of the two week conference, but at certain congested airports as little as 25% of the demand is met. Without automated trading and sophisticated systems we do not believe the current procedures could cope with trading in the individual slots at all the congested airports. Some practical clustering will be essential.

459. If slots were clustered into same time/same day elements, ie 1200 hr each Monday, the 50,000 slots would reduce to about 1,700 over the 30 week period. If the slots were allocated for a seven day week (five may be a more logical fit) the total clusters to be auctioned reduces to some 250. Remembering that slots have to be paired for take off and landing, and that many short haul operators require operated groups of at least four pairs of these, it can be seen that the total number of individual clusters could theoretically be as low as 30. In reality of course, there is a mix of operations among more than 150 airlines which would make such a low number unrealistic and impracticable. This low number does, however, illustrate what would be possible if policy was to sell large clusters and rely on airlines to break them up and sell them on.

The Effect of Fields on Cluster Numbers

460. Fields were described in paragraph 211 and the concept is argued fully in Chapter 5, Ring Fencing. The existence of fields, groupings of slots which must be used in a certain way, has a further effect on numbers of clusters. For the purposes of this section there are assumed to be four fields: domestic, EC short haul, Non-EC short haul, and long haul (international). The breakdown of traffic at Heathrow for these fields was respectively 25%, 47%, 13% and 15% for the year 1990. If domestic carriers required clusters of 12 slots (six pairs per day), EC short haul carriers clusters of 6 and Non-EC short haul and long haul carriers pairs, then the crude 50,000 slot total would reduce to 1000, 4000, 3000, and 4000 daily clusters in each field respectively (a total of 12,000). If it was decided to cluster on a seven day week basis, as described above, this would reduce to around 1700 clusters entering the main auction every six months. This would imply some 150 clusters in the domestic field and 300 to 500 clusters in each of the remaining fields.

Other Restrictions on Cluster Composition

461. As we have seen, the definition of a slot also includes the implicit effect of the operation on the ATC and the airport parking and terminal facilities. This is currently considered by the coordinator when permission is sought by airlines to swap slots. It would be necessary to model the dynamics of attaching these characteristics to the slot during allocation and trading and the sort of negotiation which would have to take place to establish the legality of a trade. Envisaging an automated system operating in a uniform environment is straightforward, but operating a system in the real world would require detailed study. The effect of fracturing the clusters into more types would be to drive up the number of clusters needed in order to achieve any given administrative effect. It might make the allocator's task more complex and the coordinator's easier, but may make the market less efficient.

Practical Considerations In Deciding Cluster Numbers

462. For a slot allocation option involving money, the allocation function has to track the market value of slots for a number of reasons, including judging the effect of changing the relative sizes of the slot fields. At first sight, the simplest method is to sell single slots, when the value of a slot at a certain time would be evident from its price.

463. Airlines naturally cluster slots into operationally workable sets. These workable clusters are likely to be more valuable than the sum of the values of the individual component slots. By implication, the last slot to make up the cluster is the most valuable of all. How can we extract reasonable market information about the desirability of both clusters and individual slots?

464. If the market is overwhelmed by the selling of individual slots, or if smaller operators cannot afford the expertise to carry out the assembly process, the result will be that the larger airlines become brokers, buying in bulk, assembling and then selling on the surplus. If the clusters are too big, the effect is the same. Only large airlines will be able to afford to buy them. They will then break them up and sell them on. It is the inevitability of this process, together with the experience in the US, where large airlines are buying slots to lease to preferred customers, which has led us to the principle that all after-trading should be by matched bid and offer by the agency as part of its allocation function. It has also led us to the conclusion that any new allocation system should exploit the current expertise of the coordinators to produce a suitable range of clusters prior to the allocation process.

465. The calculations above indicate that, theoretically, the number of clusters which would be put to auction in each season could lie between 30 and 1,700. We consider that a total of between 250 and 2,000 is easily manageable using existing knowledge of trading systems, and a modicum of automation within the EC allocation and coordination functions. Increasing the number from 1700 to 2000 would enable some individual slots to be sold. These would provide a check that the clustering methods being used did indeed reflect the market demand.

The Construction of Clusters

466. The mechanism by which clusters are constructed is likely to be an iterative process between the allocator, who wants to encourage the development of a genuine market, and the coordinator, who wants to see a swift and orderly matching of demand. By definition, the congested airports contain some historical record of the balance of demand for various clusters. As the system develops, the bidding and the after- trading will provide better and better information on the needs of the market. As the systems used by the coordinator and the airlines become more mature, trading will become more rapid. It is expected that the need for clusters will reduce, although without modelling of the processes it is not possible to predict to what level.

5. RING FENCING

INTRODUCTION

501. This chapter expands on the concept of the Field as a way of ring fencing slots so that the required traffic balance can be achieved and fair competition maintained. It is supported by additional data in Annexes C1 and C2.

502. The current slot allocation system in the UK has developed under a regime which has responded to the shortage of slots by placing more and more restrictions on the type of airlines which could apply for a slot allocation and on the type of service which they were allowed to operate from congested airports. First, it was agreed that the ICAO priorities should be incorporated in the airport scheduling committee procedures, then TDRs were imposed, which, whatever their intent, had the effect of limiting the pressure on the airport coordinators from applicants. In addition, there were always a series of bilateral agreements in place which had, as a secondary effect, the limiting of the number of airlines which were allowed to apply for slots.

503. When many of the TDRs were removed at Heathrow in early 1991, the size of the latent demand for slots was suddenly revealed. The coordinator was expected to ration the supply, but without the tools or powers to impose discipline on the market. The applications for slots have increased to the point where they exceed supply by a factor of 4 to 1 at the end of March 1991. Clearly much of this is a result of bidding without penalty; the potential traffic into Heathrow could not sustain the level of service being offered by the combined applicants. The effect has been mitigated by the downturn in international traffic. Nevertheless, any practical system must include some method of pre-sorting and prioritising applications for slots, before the actual scheduling process can begin.

EXISTING RING FENCES

504. Ring fencing of slots already exists. In the USA there are 4 categories at congested international airports: International, who are given priority; Domestic; Commuter; and Essential Air Services. In practice in most countries, political considerations ensure that operators under bilateral agreements succeed in gaining slots at congested airports. The EC is proposing to ring fence operations to include all those who can prove full

reciprocity of rights. We have developed this concept to place it on a formal basis and so make it a transparent arm of official policy.

STUDY REQUIREMENTS

505. A further fundamental requirement stated in the Terms of Reference for Stage Two is that both options developed should be workable in an EC/non-EC environment. We have studied the current system, interviewed interested parties and have noted the legal advice provided by the Department of Transport, included in Chapter 8. It is our view that for any system to work under these conditions it will be necessary to produce at least one ring fenced field for EC operators. By implication there will be at least one other for everyone else.

506. We have taken a fundamental view of the problem, broken it down into its component parts and then rebuilt a maximum number of fields which might be useful in practice. This exercise is conducted in Annexes C1 and C2.

507. In this Chapter, we summarise the process and list the fields identified as necessary for the operation of the Regulatory and Market Hybrid options we have been asked to construct. The detailed reason for these choices is laid out in Chapter 6 and Annex A and B for the respective options.

REQUIREMENTS FOR PRE-SORTING APPLICATIONS FOR SLOTS

508. There are four fundamental features for a pre-sorting exercise:

- It must be fast and flexible. This will match the need to produce compromises in time to meet the airlines' own planning needs.

- It must ensure that there is an overall balance between the supply and qualified demand from those allowed to apply. This will allow those who have to conduct the actual detailed scheduling to operate in a controlled and conciliatory manner.

- It must allow the actual demand to be judged to some extent, to give guidance to the authorities and all those concerned with the outcome of the process.

- It must allow the authorities to exercise control to a level sufficient to ensure that their policy objectives are realised.

REALISATION OF POLICY OBJECTIVES

509. Study of the policy objectives identified in Stage One, and of the past reaction of the authorities to congestion, shows that policy objectives are best achieved by grouping slots into different categories of operation or operator. A suitable variety of rules can then be applied to each. We must establish what those categories and rules should be and how they should be applied.

510. In Annex C1 we have broken down air operations into a range of possible groupings. These have emerged under 11 headings as follows:

- By the nationality of the operating airline.
- By type of route supported by the use of the slot.
- By the quality of the service.
- By the level of official support.
- By type of aircraft contents.
- By type of operator.
- By type of operational integration.
- By airline history.
- By historical usage of slots.
- By policy requirements.
- For equal opportunity balancing.

The full analysis shows that there are at least 250 ways in which it would be possible to describe a particular slot use. One aim of Stage Two has been to find descriptions which meet the criteria of being flexible, unambiguous and useful in solving the pre-sorting problem for the scheduling organisation.

THE CONCEPT OF THE FIELD

511. The literature shows that there is a whole range of terms used to describe this concept of identifying slots. ICAO uses Categories, others use User Groups, some use route type; many others are found. For the purpose of this study the term 'field' has been adopted. From the aggregation of slots of every type and description, as revealed by the decomposition, can be extracted fields of slots which have useful common features. These features may be because of: their physical characteristics (which airport, what time); their use (long haul, short haul); or the attitude of the authorities to them (priority, or to be sacrificed first).

512. In principle, many slots could belong to several fields. What is certain is that all slots have to be in some field; the concept of fields is just an application of the mathematical theory of sets. A field is defined by who is allowed to operate within it, and what rules apply to the operation and to the cycle of slot allocation, trading and sacrifice. To be useful to the slot allocation process, the fields must be mutually exclusive; each slot must be assigned to one field only.

TYPICAL TOTAL POPULATIONS

513. The total available slots at Heathrow and Gatwick combined is in the order of 600,000 a year. Study of the list in Annex C, and the Policy Objectives, shows that the amount by which the 250 potential fields and the 11 field types can be reduced depends on the granularity and precision of policy direction needed to ensure that the demanded results are achieved. In a fully regulated regime, every detail of every slot would have to be considered by the authorities, in order to place each one in priority order. In contrast, in a free market system, all slots would be in a single field. For a practical system we must determine how many fields are required to satisfy a particular set of policy objectives in a system operating under a particular set of constraints.

OPTIONS TO BE STUDIED IN STAGE TWO

514. The Stage Two study is focused on two options which, it emerges, are broadly similar in their need to differentiate between the various slot uses. They both have to be developed from the situation as it appears today, have to operate in the international

arena, and be appropriate to all EC congested airports. They both have to operate in a mixed EC/non-EC environment. There are two fundamental differences between them: the Regulatory option does not allow money trading and must lie near the administrative end of the market spectrum, while the Market Hybrid does use money and is half way towards the free market.

515. Study has shown that it should be possible to build fields which are very similar in both cases. However, the Regulatory option, because of its nature, is likely to need some extra fields and some extra rules within its fields. It has to compensate for having to operate with slots having an implied value function, rather than using money as does the Market Hybrid system.

LIMITED FIELD TYPE SET

516. Having considered the decomposition in Annex C1, at this stage of the construction process it seems that all the requirements for control for most options can be met with a total of not more than 19 fields, divided among four types. These totals can only be reduced after further study of the details of the fields and of the policy objectives. Reduction may be possible but the systems must be equipped with sufficient fields to cope with the transitional phases and unexpected problems. The balance of this Chapter sets out these 19 fields and concludes by identifying the sub-set needed for each of the two particular options studied here.

517. The details and contents of the four field types which are needed are discussed below. The broad type definitions are:

- *Operations type slots,* where the purpose of the operation and its regularity are defined; eg Cargo and Scheduled.

- *Qualified Operator type slots,* where the operator of the slot is identified; eg EC and Small New Entrant.

- *Route type slots,* where slots are identified with particular, specific routes; eg Thick Routes and Public Service Routes.

- *Airport Management type slots* is a generic term to identify a slot which has been removed or held back, to allow it to be traded or allocated in real time, to increase the short term efficiency of the scheduling operation.

POTENTIAL OPERATIONS TYPE FIELDS

518. All those policy objectives which imply the need to balance the use of congested airports require that the type of traffic is differentiated. The two options in Stage Two could be served if the following Operations type fields were available:

- Scheduled Passenger.
- Scheduled Cargo.
- Charter Passenger.
- Charter Cargo.
- General Aviation.

519. All these are well understood and there should be no difficulty in constructing fields to accommodate them. The Cargo and the General Aviation types will have to be included to ensure that the value which these services put on slots into congested airports is considered. In a money option, this value can be obtained in a relatively free market. It may be that the very short term lease and same day trading will provide enough capacity to make these last two fields unnecessary. In addition to these operations there are engineering, positioning, calibration and training slots. These would normally be satisfied by the short term trading and the use of Airport Management type slots.

POTENTIAL QUALIFIED OPERATOR TYPE FIELDS

520. To influence the commercial and political aspects of airline operations, which are usually identified by size or influence, and to implement the large number of bilateral agreements, which are based on some form of national identity, fields have to be identified by the type of operator who is qualified to apply for or bid for slots. The two options studied in Stage Two can be satisfied by the following set of Qualified Operator fields:

- United Kingdom.
- European Community.

- Foreign General.
- Bilateral.
- Small New Entrants.
- Large New Entrants.

521. The study has assumed that there will be a progressive merging between the UK and the EC identification. No special procedures have been put in place to support differentiation, but, in theory, it would be possible for the UK Government, for example, to require a special category for those EC airlines which it considered to be truly integrated into the EC market, in spirit as well as by regulation. These airlines could then be treated as UK operators as far as control is concerned. We have not allowed for this, because we believe some current multi-airline systems in Europe are very open and could be models for an EC-wide field. However, there is no reason why a National field should not be invoked.

The Bilateral/EC Fields

522. The EC has stated that it is the intention that, in due course, foreign airlines which are sponsored by governments which in turn offer full reciprocity of rights to EC airlines, will be treated as if they were in fact EC airlines. This would imply that the foreign identification would be progressively eroded with time. We address this in detail under the Bilateral headings in Chapter 6.

The Problem of the New Entrant

523. All policy makers seem to agree that new entrants should be encouraged, but the definition of a new entrant is causing particular difficulty among all constructors of slot options. General descriptions fall down because they result in the long term discrimination against incumbents. Study has shown that there are two types of new entrants which have to be considered: the small and the large, and these are discussed below.

The Large New Entrant (LNE)

524. The LNE is defined for the purpose of this study as an airline which is financially secure and well established on its own route network. It now wishes to expand on to routes which have up to now been dominated by some other airline(s). Should the new, large airline be given priority to obtain slots to support the new operation, and if so, from whom should they be taken?

525. In the free market for slots this would not constitute a problem. In the Market Hybrid option, the Large New Entrant would only have to prove that his own competitive environment meets the criteria for entry into a particular field. He would then be free to bid for slots in that field. The application to a particular service of any slots won would be for him to arrange.

526. In the Regulatory option it is more complex. The EC has proposed that a new entrant should be allowed to match any route service and be given slots. It is not explained where these slots should come from, apart from taking from other operators on that route above a certain frequency level per day (6 slots). We believe this runs the risk of fracturing all routes and airlines until they are all unviable. As explained in Chapter 6 and Annex A we have chosen a more general approach: allocating slots but leaving it to the new entrant to decide the route.

The Small New Entrant (SNE)

527. The SNE may need protection within a special field while the particular operation is developing. The definition of SNE is likely to include: the gross size of his operation in terms of passengers or cargo carried, or the proportion of his operation represented by the routes which he is applying for. Examples might be the number of turboprop aircraft with less than 30 seats, the number of jet aircraft in the fleet, etc. The methods by which protection for SNE is withdrawn, without inhibiting the incentive for the operator to grow and become independent, need special consideration. The method is unique to each option. This is discussed in Chapter 6.

528. If the weakest are to be given precedence, there is a risk that the routes will be blighted by a large number of business failures. If the strongest are favoured, on the grounds that they will need protecting for the shortest time, the weakest will never be given a chance. Added to this is the fear that, as more and more new entrants are protected, the chances of any one of them becoming independent of this support

becomes less and less. The judgement as to whom to award SNE status and for what proposed use of the slots is a key power resting with the agency in the Regulatory option.

529. In the Market Hybrid option, a special field would restrict bidders to those which had SNE status for the routes which they intended to operate. All those who so qualified would then have to bid for the slots allocated for the purpose of encouraging SNEs. These would not be route dependent. The winners would be those airlines which considered that they could afford to bid the most for the routes they had chosen.

530. A set of rules must be developed which progressively withdraws protection from small new entrants, either because they have become sufficiently strong, or because they are clearly not going to become so. This application of the parable of the talents is best conducted on a time basis, and is discussed in Annex B.

531. In both the options being developed in Stage Two, the Small New Entrants are given the advantage that they have longer to set up the new service (one year instead of six months) but will lose the protection after two years. Low load factors, small numbers of passengers, or even a failure to achieve the forecasts which were made at the time of applying for Small New Entry status, could be the cause of loss of protection or even confiscation by the agency.

532. In the case of the Regulatory option the unused slots will be returned to the pool. In the case of the Market Hybrid the entrant will have to pay the full rent. This will encourage the unsuccessful new entrant to sell the slot in the market. It is likely that the agency will insist that it is retained in the Small New Entry field. The seller would not then, in selling, be able to benefit from the low price he paid originally. He would of course be highly motivated to get the slot removed from the SNE field, because he could then sell the slot or show its value on his balance sheet at the free market lease value.

POTENTIAL ROUTE TYPE FIELDS

533. Routes can be described by their traffic volumes or their geographic structure. Traffic volumes are thick or thin, while geography defines whether they are short haul or long haul. There is a further set of slots in this type: those which are needed to maintain a network, or which form part of feeder services which are needed to make other services viable.

534. The two options being studied in Stage Two can be serviced by a subset of the following fields of the Route type:

- Thin Routes.
- Thick Routes.
- Public Service Routes.
- Long Haul.
- Short Haul.
- Feeder Services.
- Network Maintenance Services.

Thin Routes

535. Routes with little traffic or where the traffic will not stand a regular service may have to be protected in certain instances. A field may have to be reserved for these at least in the initial stages of any transition period. It may be that most will be taken into the Public Service field as the options mature. Neither option requires this type of field.

Thick Routes

536. In certain circumstances thick routes will be the default description for slots. In the Regulatory option it may be that thick routes will be special candidates for sacrifice, and for preferential allocation to new entrants. This is the basis of the current EC proposal. Neither option requires these.

Public Service Routes (PSR)

537. Both the options being studied require a field whereby the agency can encourage or demand support for marginal air services. The political pressures to support such services will mount if they become threatened, and will become a major obstacle to the operation of the Market Hybrid if a mechanism for support is not provided. In the Regulatory option, PSR can be used as a bargaining counter by the agency by which they

allow certain other privileges to operators who agree to operate them. In the case of the Market Hybrid, the agency can restrict competition on a particular route and thus increase the value to a bidder.

Long Haul

538. This is a generic field which contains all routes longer than say 3,000 km. This field is established to distinguish and protect the short haul operations from being squeezed out (which would be the trend in a fully free market) by long haul operations. Most bilateral and other international route operations fall in the category. Short haul operations will be covered by the field of feeder/commuter/regional routes. Both options use an EC Long Haul field which would contain all those long haul slots operated by EC-qualified airlines, as described in para 522.

Short Haul

539. This is the obverse of the long haul field. Probably defined by a range of less than 3,000 km, it includes routes which require protection from the high prices which could be paid for slots by prosperous long haul carriers. It also contains slots which the official objectives indicate need protection to encourage short haul travel. Both options use an EC Short Haul field.

Feeder Services

540. The Feeder Service field may be needed to maintain thin routes into a congested airport. The service may be important but not justify a full Public Service rating. It may merely make the services in the field secure from enforced sacrifice. We have not had to make use of this field in the two options under study.

Network Maintenance Services

541. Network Maintenance fields may be needed to regulate the market, so that airlines which have built fragile networks, do not have them destroyed by either official sacrifice policy or by the predatory bidding by their rivals, for vulnerable elements of their operation. This may be needed in the Regulatory option.

AIRPORT MANAGEMENT TYPE FIELD

542. Experience has shown that any congested airport needs to have some slots in hand so that it can recover from surges in demand and unforeseen disruptions of its operations. This fact is already built in the present airport (including ATC) capacity values used today. Both options will need to be able to identify these. It will give the agency and the scheduling organisation the flexibility to manage the airport efficiently and safely, as is presently achieved, but in a more visible manner.

543. The slots from this field can be allocated or sold, once the airport authorities are sure they will not be needed. It may be possible that slots which have been allocated but are not to be used could be placed in this field. There are a number of operations which could take advantage of this short term market. General aviation and cargo operators have both indicated that they could add value to unused slots if these were progressively placed on the market by a central organisation.

RULES FOR FIELDS IN PARTICULAR OPTIONS

544. The rules which are required to make a particular field work within the option can be broken logically into a number of types. These flow naturally from the nature of the field and the type of control which can be exercised under the particular option. These will be different for the Market Hybrid option compared with the Regulatory option. They can be gathered into the following general groups. Each of these is discussed in the detailed description of the options set out in Chapter 6.

Entry Qualification Rules

545. Each field will require specific entry qualifications by an operator. Operators will have to prove that the nature of their operation and the service they propose are consistent with the commercial and policy assumptions for the field, eg free competition, or bilateral protection, or Small New Entrant, etc.

Bidding Rules

546. These should be general but may have to include small variations. They are explained in Chapter 6 under the appropriate option heading. They may involve sealed bids, caveated bids, or merely a special or historical claim to a particular slot or service.

Allocation Rules

547. These may be established rules or as a result of winning at the auction. They may involve a complex iterative process to decide the final candidate. In order to prevent the build up of a monopoly within a field, there may be a limit to the proportion of slots within some fields which can be allocated to a single operator or consortium.

Post Acceptance Rules

548. These include the time allowed to take up the slots and the penalties for not doing so.

Trading Rules

549. These include the details of trading inside and between fields. Rules regarding swapping, money trading and the role of the agency in controlling the market will also be needed.

Sacrifice Rules

550. All these are imposed by the agency. They involve not only the identification of slots as candidates for sacrifice but also the protection and appeals procedures for incumbents who feel their interests have been unfairly damaged.

Confiscation Rules

551.. These include details of all those actions and occurrences which could justify the agency taking slots away from incumbents and re-allocating them. They include 'use it or lose it' rules and illegal trading and use. They also include the warning, notification and appeals procedures.

FIELDS REQUIRED BY THE OPTIONS

552. The fields required by the options are listed and illustrated in Figure 5.1. The detailed reasoning is given below and expanded in Annex C, Chapter 6 and Annexes A and B.

Market Hybrid Option - Field Requirements

553. Reviewing the potential fields discussed earlier, there is a minimum number of fields which the Market Hybrid option would need. Being a Market Hybrid, the option should need fewer and simpler fields than the Regulatory system. As presently constructed the Market Hybrid option would need the following 6 fields:

554. *EC Long Haul* - To confine premium bidding to support very profitable services.

555. *EC Short Haul* - To protect low profit routes and encourage short haul travel within the EC.

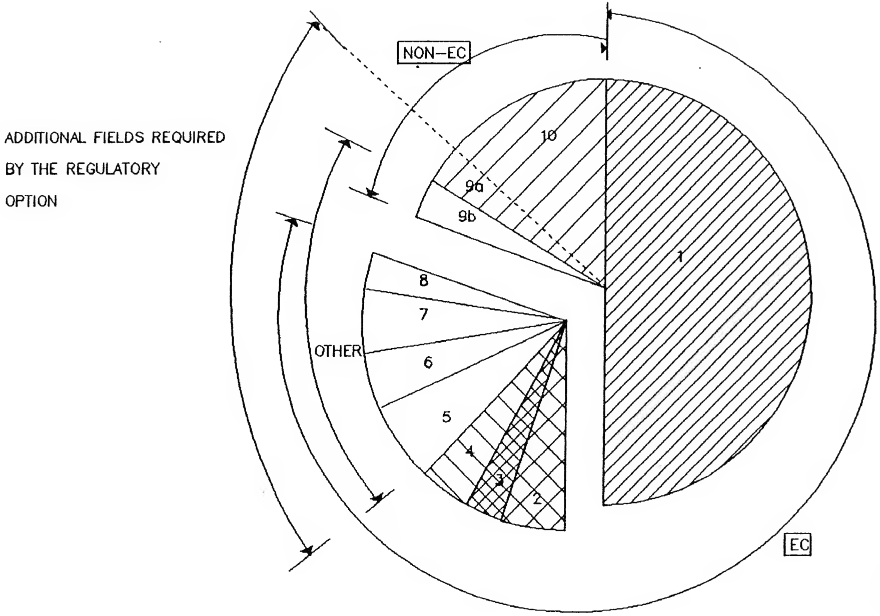
556. *Bilateral* - To cater for international agreements and limit unfair foreign competition.

557. *Public Service* - To cater for all those services which needed protection.

558. *Small New Entrant* - Defined as described in paragraphs 527 to 532. Giving protection to weak entrants for a limited period.

559. *All Other Categories* - Containing such operations as unscheduled cargo, general aviation and airport maintenance.

FIGURE 5.1 TYPICAL ALLOCATION TO FIELDS



	Regul.	Mkt.	
1. SHORT HAUL	✓	✓	
2. LONG HAUL	✓	✓	
3. PUBLIC	✓	✓	
4. SMALL NEW ENTRANT	✓	✓	
5. LARGE NEW ENTRANT	✓		OTHER
6. MANAGEMENT	✓		
7. CARGO	✓		
8. GA & BUS	✓		
9. FOREIGN GENERAL	✓		
10. BILATERAL	✓	✓	

NB.

9a. Part of Foreign General Field,
in transition to a Bilateral

9b. Part of Foreign General Field,
in transaction to an EC field.

Note: Field sizes are for illustrative purposes only.

Regulatory Option - Field Requirements

560. Without the discipline of the free market, and with the need to control and justify its actions in the market in considerable detail, the Regulatory option will require the decomposition of the 'All Other' into five further fields, making ten in all. These extra fields are:

561. *General and Business Aviation* - A field will be created with a number of slots especially geared towards those users presently exploiting ad hoc, 'opportunity' slots. The maximum percentage of total slots allocated for that purpose is estimated to be between 5-10%.

562. *Foreign General* - This field caters to foreign routes and air services not operated under any bilateral agreements. The field will receive, upon full reciprocity with EC countries, the same treatment as the EC field. This field may be split to cater for carriers in transition into the EC field (see 9b in Figure 5.1) and in transition to bilaterals (see 9a).

563. *Large New Entrant (LNE)* - A LNE is a large existing carrier trying to operate on routes it has been excluded from because of congestion at airports.

564. *Airport management* - This field allows for surges in demand.

565. *Cargo* - This field caters for cargo operations.

6. THE TWO SELECTED OPTIONS

INTRODUCTION

601. During the Stage One work, we identified four slot allocation options which we recommended for further development. They differed in their market philosophy, and ranged from the most tightly regulated (the Full Regulatory), through two more liberal hybrid solutions (the Regulatory Hybrid and the Market Hybrid), to a Free Market option which would be constrained only by the normal rules of monopoly control and fair trading.

602. Two were selected by the Department of Transport from these four for study in Stage Two. The first was the Full Regulatory option, referred to now simply as the Regulatory option, a modification of the current system but with stricter sacrifice and confiscation rules designed to provide opportunities for new entrants. The second was the Market Hybrid, which is a money option based on the sale of leases, but with the market controlled by an agency with a clear mandate to ensure that policy objectives are met.

603. This chapter presents first the features which are common to both options, and then describes in outline the options themselves. Each option is fully described in an annex to this report, the Regulatory option in Annex A and the Market Hybrid option in Annex B. In some areas we go into great detail in the workings of sub-elements of the option and the logic behind the elements used.

FEATURES COMMON TO BOTH OPTIONS

The Agency

604. Both options make use of an agency to operate the slot allocation system concerned. The agency need not necessarily be a large bureaucracy; it needs only to be big enough to perform its roles and is likely to be similar in size to the coordinator's staff today. In the UK, policy will be handed to it by the Department of Transport. The agency must interpret that policy into rules, and apply the rules to make the slot allocation system work in year-by-year and day-to-day operations. It will be required to arbitrate disputes, to report to both the Department of Transport and the wider communities on the operation of the slot allocation system, and to represent the airport

at the IATA scheduling conference and on other bodies whose decisions affect the coordination and capacity of airports.

605. In working the slot allocation system concerned, the agency will have to reflect the policy handed down to it and define the fields, administer the sacrifice and confiscation measures to create the slot pool, and assemble workable clusters from the pool for airline use. All these activities are discussed in more detail in the option descriptions which follow, and are described completely in the appropriate annex. A diagram of the agency actions is at Figure 6.1. The role of the agency in the two options is explained later in this chapter and in Annexes A and B. They are represented in simplified form in Figures 6.2 and 6.3.

Fields

606. As explained in Chapter 5, both options require the use of fields to ring-fence slots according to use. Until a global liberalisation of air transport is achieved, and it seems a long way off, the number of slots available for different categories of operations, operators and routes have to be set in line with established policies. Fields give the agency the practical means of achieving what is required. Each field has three characteristics: what slots it contains, who can be granted them and what rules apply to their use.

607. Different sets of rules would apply in different fields. The rules would be made as simple as possible, consistent with the efficient operation of the system.

Clusters

608. As explained in Chapter 4, for both options the agency would need to assemble workable sets of slots (clusters) for re-allocation. Clustering is already an integral part of the current allocation process and we take the view that the airline professionals in the agency are best placed to identify these workable sets. Some sets may assemble themselves; an operator taking one aircraft out of his operation, for example, would release a set of slots which would be immediately attractive to a new entrant proposing to operate a similar aircraft on similar sector lengths. For the most part, however, we expect the agency to assemble sets of slots, from within the pool, which meet the requirements of the market. They do this now; after-trading swapping takes place now after the IATA conferences. Having observed this, we are confident that collecting slots into workable sets is a mature process which is well understood by the participants.

FIGURE 6.1 SEQUENCE OF OPERATION OF SLOT ALLOCATION

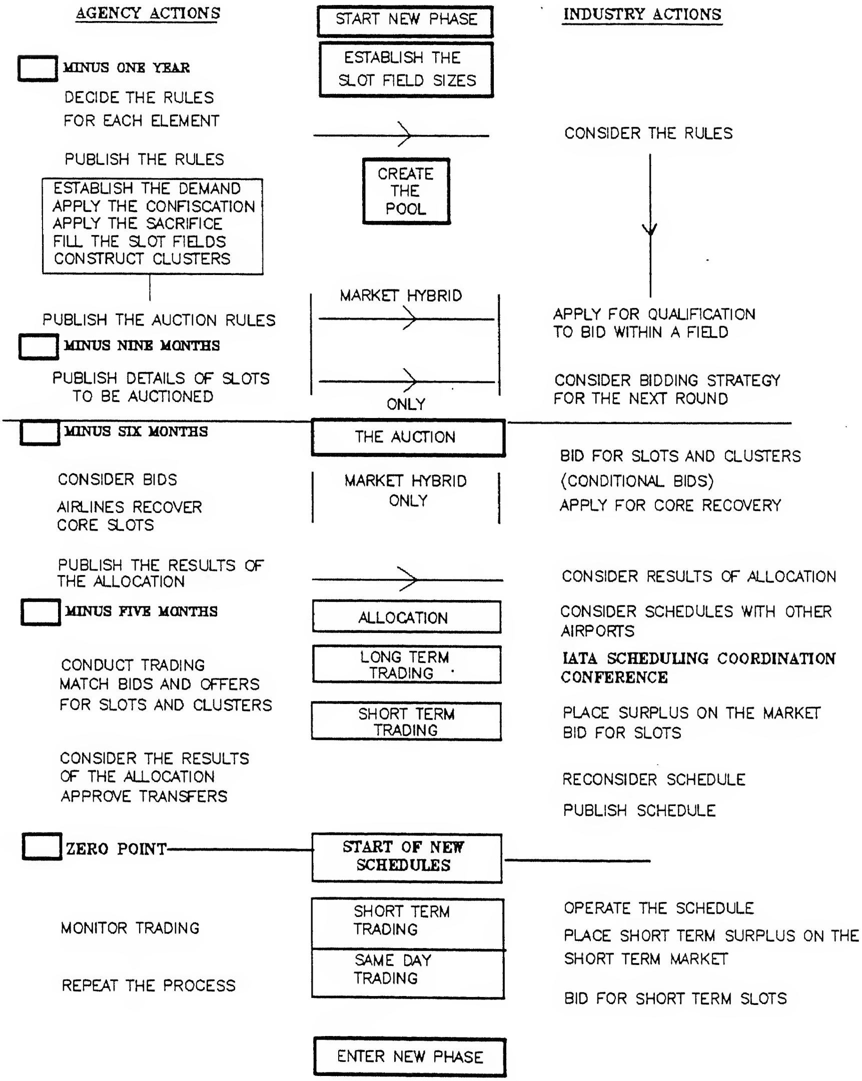


Figure 6.2 REGULATORY OPTION–OVERALL OPERATION MECHANISMS

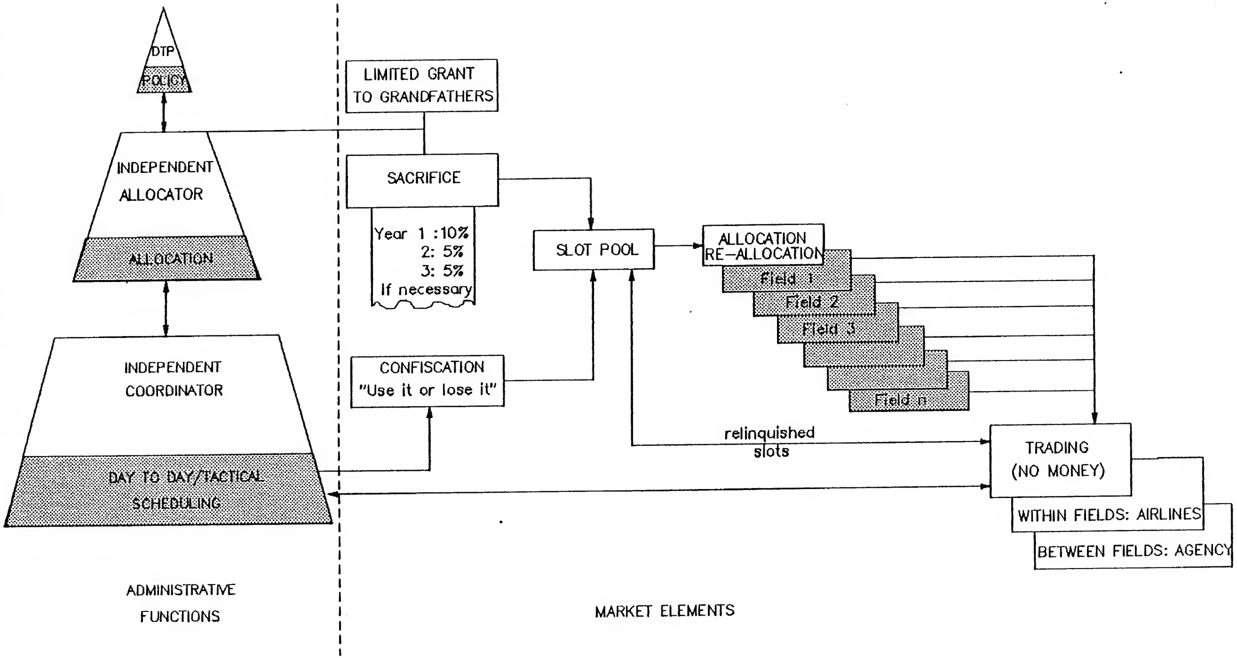
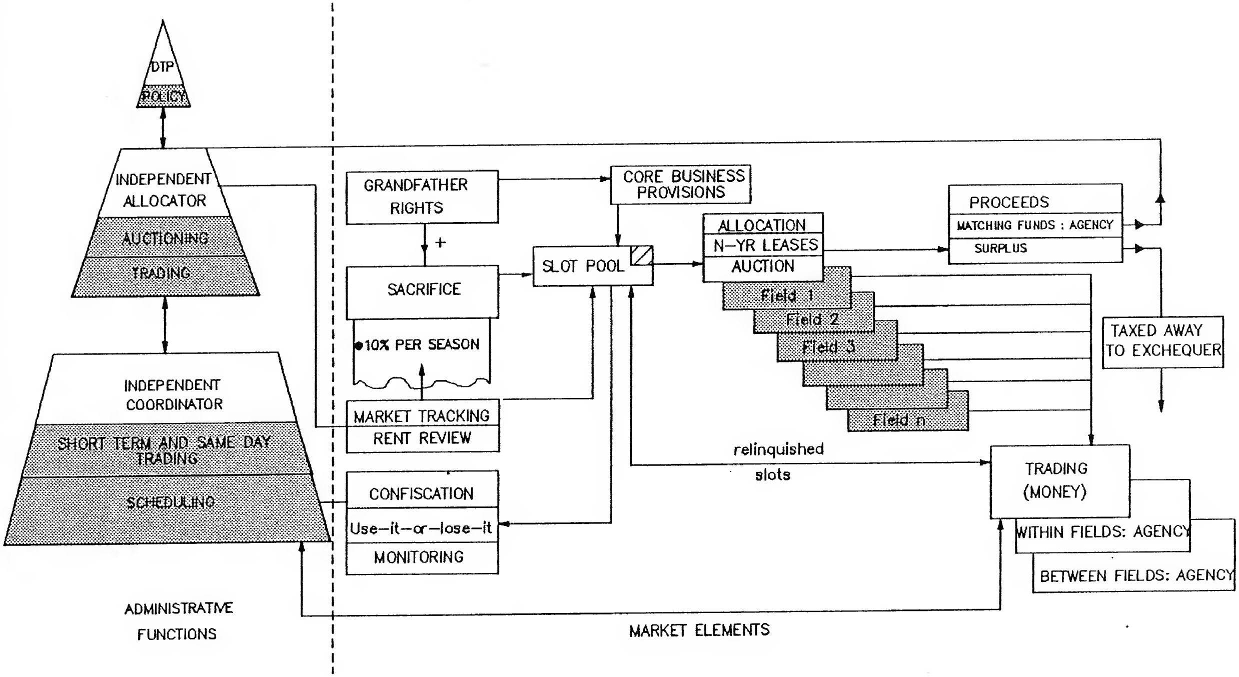


Figure 6.3 MARKET HYBRID OPTION—OVERALL MARKET MECHANISMS



Elements of the Options

609. As we described in Chapter 4, all slot allocation methods have four fundamental parts: initial allocation, sacrifice, trading, and re-allocation. The two options selected for further study will be described under those headings.

OVERVIEW OF THE REGULATORY OPTION

610. The full description of the operation of the Regulatory option, together with an assessment of its qualities in meeting the criteria we have set for assessing options, is contained in Annex A. A diagram of this function was at Figure 6.2. This section contains an overview of the key features. An assessment of the merits and effects of the option in relation to the criteria laid down in the Terms of Reference and compared with the current system is in Chapter 7.

Initial Allocation

611. The Regulatory option is intended to involve as small a change as possible from the current system. We therefore designed it to start operation with grandfather rights granted to the incumbents. Where there were spare slots, initial allocation would heed the policies of providing opportunities for new entrants, and for fostering competition on monopoly and high profit routes.

612. The initial allocation would stand for some time, we suggest 3 years, to allow the holders to prepare for the sacrifice provisions. In the first year, slots would only be confiscated in accordance with the IATA principle (non-use last equivalent season); in the second, slots would be confiscated if much harsher 'use it or lose it' rules were broken. During the initial allocation period, swapping of slots within fields would be permitted, and between fields with the permission of the agency. In this case, permission would only be given if the proposed swap was consistent with maintaining the fields at their required sizes; a trend to pile out of one into another could not be tolerated unless policy had identified that this was necessary. Of course, no money or secondary contracts would be allowed in such trading.

Initial Sacrifice

613. The Initial Sacrifice is intended to create a viable pool of slots for new entrants. We propose that 10% of existing slots should be taken away from incumbents as a one-

off procedure, but that the rules for this measure should be mitigated for recent new entrants or for those with some minimum number of slots. The 10% initial sacrifice would be proportional to an airline's total holding of slots at an airport, and is expected to extract from the present incumbents mainly the slots that are not absolutely vital to their operations. Nevertheless, we recognise that the measure will impose a pressure on the incumbents.

614. Incumbent airlines could try to give away their least desirable slots to satisfy this requirement, and in so doing make it impossible for the agency to create commercially desirable or viable slots or clusters of slots. The choice of those slots to be sacrificed can therefore not be left entirely to the airlines. The agency must be able to specify particular slots it wants in place of unsuitable ones offered. Airlines would be able to state an order of preference.

615. We are aware of the unpopularity of such a measure. But it is fair, in that it provides equal pain for all, by depending on the size and distribution of the incumbents' slot holdings. It will enable competition to be injected into a stifled market. And it is also fair that airlines with a large number of slot holdings at a congested airport should be more vulnerable to losing their slots than should a recent incumbent with only a few slots per day. Objections to the sacrifice principle will never disappear, but they must be over-ridden if the status quo is unacceptable to the authorities.

Recurring Sacrifice

616. Following the initial sacrifice, other sacrifices must occur to make enough slots available to meet the backlog of demand by new entrants in each field. Some slots will be given up voluntarily, and business failures will also generate slots. The 'use it or lose it' rules would be harsh. Slot audits would reveal actual as opposed to entitled use, and monitor loads carried. The agency would be empowered to call in slots if they were not being used properly.

617. If these provisions did not generate sufficient slots in the pool, which we estimate needs up to 5% of the total number each year, an enforced sacrifice would have to be imposed. As with the initial sacrifice, it would be a percentage of slot holdings from all operators, less the exceptions as before, the actual percentage to be decided by the agency depending on the requirements of the slot pool. There would then be a moratorium on forced sacrifice while the market settles down and until the agency is able to assess the impact of the initial actions on the industry. The external environment will

also change and this will demand a further policy review. It is expected that a cycle of about 2 to 3 years is needed to allow the sacrifice mechanisms to operate and for its effect to be measured against policy objectives. Thus the sequence would be: 2 years of reinforced 'use it or lose it' rules followed by a 10% sacrifice, a two year pause followed by, say, two 5% sacrifice years, followed by a further pause.

Trading

618. The rules for trading would remain the same as those described in paragraph 612. Immediately after the initial allocation, swaps of slots would be allowed, with the agency monitoring each transaction. These would be unconstrained within fields but subject to the agency's permission between fields. No money would change hands, and the operation would be similar to that of today.

Re-Allocation

619. Following the sacrifice, the agency would re-allocate the slots to fill underpopulated fields with new entrants, and to reinforce the operations of other recent entrants. Preference would be given to those who had applied unsuccessfully for longest; we suggest that the current method used by IATA and the scheduling committees is very satisfactory. We rejected the idea of a lottery, as has been practised in the USA, as its randomness seemed to us to be an unsuitable feature of slot allocation at major international airports and that there were better ways of being seen to be fair.

620. Slots which become available out of the main allocation sequence would be re-allocated according to the policies being followed by the agency. To achieve these, the agency might apply some priority order, such as first satisfying potential new entrants disappointed the previous season, other new entrants, making good previous allocations that were unsatisfactory, or recovering damage to incumbents.

FIELDS REQUIRED BY THE REGULATORY OPTION

621. This section should be read in conjunction with the similar section below, which addresses the Market Hybrid. Chapter 5 explains the essential role that fields play in allowing the administration to control the traffic balance in the market. The greater the precision required, the greater the number of fields needed.

622. The full decomposition of fields is at Annex C1. The characteristics of all the practical fields are laid out in Annex C2, which includes their detailed definition and the rules concerning the major aspects of their operation. This section lists the particular fields needed to operate the Regulatory option, with an explanation of their use.

Considerations in the Choice of Fields

623. In principle it is desirable to have as few fields as possible. As explained in Chapter 5, the free market would have only one. The Regulatory option requires to differentiate between the EC and non-EC, which implies two fields. We next consider differentiation within the EC operations. All the arguments are the same for both options, they are symmetrical in this respect. The differences are that the rules applied within the various fields are different. Their effect will also be different because they are operating in a fundamentally different market environment.

624. The Regulatory option does not use money. The allocator uses judgement when intervening in the market. To control this power we judge that this option needs a number of additional fields over those needed by the Market Hybrid. These will make the intervention overt and easy to understand. This was illustrated by Figure 5.1. This section concentrates on the extra fields which this option needs and the differences for the Regulatory option in the fields which it shares with the Market Hybrid.

The Bilateral Field

625. We have followed the EC thinking on this, that all those who can offer full reciprocity to EC airlines should be granted EC status for slot allocation within the Community. We conclude that all remaining operators will invoke some bilateral agreement to claim their slot rights. As such they will invoke exemption from the sacrifice. We have thus placed all non-EC airlines operating services subject to bilateral agreements ('bilaterals') in the Bilateral field. They will be allocated slots according to their bilateral rights, which many of them already exceed. They will be encouraged to give up their rights and join the EC fields. The negotiation for the transfer is seen to be a major task in implementing the Market Hybrid option.

Differentiation within the Bilateral Market

626. The process of transfer is likely to result in some operators moving out of the bilateral field towards the EC fields, and some requesting slots without the support of

bilateral agreements. The administration will require that operators have been audited to confirm that their sponsors provide the EC with full reciprocity and that their commercial regime does not give them unfair advantage.

Foreign General Field

627. To satisfy this demand, a Foreign General field will be needed. In this, foreign operators can apply for slots and would be granted them for a limited period, but not with grandfather rights until they entered the EC fields. Considerable diplomatic and legal activity would take place over this field, but it would allow the allocation function to pass these issues to the policy function, while the operations continued. If liberalisation progressed, this field would contract as the transition phase matured. The Foreign General field is intended as a stopping place for services bound either for bilateral (see 9a in Figure 5.1) or EC fields (see 9b).

Differentiation of EC operations

628. We have considered the needs and methods of differentiating the EC operations. Some authorities have indicated that they will require protection for their carriers. There is no reason why the National field should not be invoked, but we believe that this is against EC policy. We have not allowed for this, although one might be useful during transition, to the time when all EC nations were satisfied that each was applying the rules fairly. As explained below, we have allowed for a Public Service field which might also attract direct subsidy from a government.

629. The policy objective analysis made it clear that there was great anxiety that the pressure from long haul airlines to displace short haul would have a detrimental effect. This was supported by almost all the operators we interviewed. We have not been asked to model this process but some idea of the scale of the problem is detailed in Chapter 7. The authorities also expressed a specific demand that new entrants should be encouraged. We have therefore also allowed for a field in each of these three categories.

The EC Long Haul Field

630. Remembering that the purpose of this field is to limit the pressure on other fields by limiting the ration of slots dedicated to long haul operations, the dividing line between this and other fields is one of judgement. We expect some friction over the definition because moving an operation across the boundary is likely to change an airline's chances

of allocation markedly. Operations may be defined by a distance limit. Rules will have to be developed concerning networked flights. The level of genuine application for slots in this field will be some indication of the effect of official intervention.

The EC Short Haul Field

631. This field is at the heart of the system. It will represent over 50% of the slots at most congested EC airports. It will need a wide variety of clusters to satisfy the operators. As the market is progressively freed by sacrifice during implementation, we expect that the trading activity in this field will rise to the levels now seen at the uncongested EC airports. While the shortage of slot capacity remains, we expect that there will be constant pressure to extend the definition of the range boundary and allow the transfer of slots from this to the Long Haul field.

The New Entry Fields

632. In the Regulatory option, help is required to assist all new entrants. It is argued in Annex B that with the Market Hybrid there is no need to make special provision to aid a well financed established carrier. Both the options specifically avoid imposing administrative action at the lower level of the system. Which routes carriers operate depends on their judgement alone.

The Small New Entry (SNE) Field

633. The policy objectives clearly reveal that some way of helping small carriers to become established is necessary. We have suggested definitions of the SNE in Annex C2, but there is no reason why a more or less liberal definition should not be applied. It is not clear how large this field should be. A starting point of some 5% seems to be the consensus among unbiased observers. The policy will be to erode the privileged protection for the incumbents over a number of years. All qualified new entrants will be able to apply for slots. It will be for the winners to decide where they operate. The only advantage to the new entrant is a period when he is free from sacrifice and an extended period before the slot is confiscated for non use.

The Large New Entrant (LNE) Field

634. Unlike the Market Hybrid, this option needs a mechanism by which large new entrants enter the market. There is no need to make special concessions as to start up

time. The airline could also be required to provide the allocator with a plan to show how he intended to use the slot. If the plan failed and the resulting loss of efficiency of the airport facilities was significant, the slot might be subject to confiscation and placed back in the slot pool for new entrants.

The Public Service Field

635. Our analysis of policy indicates that provision should be made for a small number of slots to be reserved for public service operations. We have not investigated the number of these which may be needed at the average EC airport but it is thought to be small. During transition, some nations may invoke this field in order to provide, what would be in effect, a National field, to protect their market. The audit process should detect and stop this abuse. This will make public subsidy overt and subject to EC scrutiny.

The Cargo Field

636. Current policy is to exclude cargo from Heathrow during peak congestion hours by the application of TDRs. The logical application of this in the Regulatory option is to have a Cargo field. It can be filled or not as policy dictates. Our studies indicate that there may be an argument for allowing in scheduled cargo to congested airports where the choke point of capacity is the terminal facilities rather than the runway. This field is not needed in the Market Hybrid where the ability to pay will decide if cargo operates.

Slot Management Field

637. Most airports underdeclare their capacity to allow for disruption. We suggest that this buffer capacity should be declared and placed in a special field. It can be used for short notice operations if it is not needed to smooth surges in demand. The Market Hybrid will use short term and same day trading to identify this spare capacity.

General and Business Aviation

638. Current policy is to exclude General and Business Aviation from Heathrow during peak congestion hours by the application of TDRs. As with Cargo, the logical application of this in the Regulatory option is to have a General and Business Aviation field. It can be filled or not as policy dictates. Our studies indicate that there may be an argument for allowing in general and business aviation to congested airports where the

choke point of capacity is the terminal facilities rather than the runway. This field is not needed in the Market Hybrid where the ability to pay will decide if general and business aviation operates.

Summary of Fields Needed

639. The full analysis in Annex A of the Regulatory option shows that all the objectives can be met with these ten fields. Sufficient control can be maintained on the traffic balance to ensure that the policy objectives can be met and that the system will be stable and only contain low internal tension. Some additional fields may be needed during the transition phase but concerted action by the agency and the governments should control this. Note that this option requires four more fields than does the Market Hybrid, which operates in a freer market. A fully free market would, of course, only use one field; anyone could join.

THE ROLE OF THE AGENCY IN THE REGULATORY OPTION

Introduction

640. The Regulatory option is developed from the current system, with stiffer confiscation and sacrifice rules. For its success it will depend upon the actions of an agency empowered sufficiently to make it work. The three tier structure of the agency described in Chapter 4 is universally applicable. In the Regulatory option, the agency's operation reflects the policy handed down to it and controls totally the allocation and coordination of slots.

The Agency Policy Function

641. In the UK, policy is decided by the Department of Transport and handed down by them either directly or through the CAA. For the Regulatory option, the policy makers will decide the capacity to be declared for the congested London airports, and the sizes and nature of the fields into which the slots are to be allocated. The allocation and coordination functions will work closely with the Department of Transport so that they both understand the decisions being made on issues such as any changes to airport charge levels and international agreements.

642. The agency will apply long, medium and short term policies. Long term policy reflects objectives over 5 to 10 years; examples might be the overall shift in the size of the

fields, or a policy to allow a new type of operator into a congested airport in that timescale. Medium term policy would translate such ideas into a 2 or 3 year plan. Short term policy would affect the daily tactical and operational actions; monitoring of slot usage is an example.

The Agency Allocation Function

643. The agency has a very visible role in its initial allocation of slots by granting limited grandfather rights to the incumbents. These slots will be in the fields specified from policy, and the agency will adjust the fields every year to reflect both policy and developments in the market place.

644. The allocator will be independent. He will interpret the rules. The agency's most powerful and controversial role in the allocation process is in its application of the sacrifice rules, both initial and recurring. It will aggregate the sacrificed slots into viable clusters for allocation to new entrants and to other applicants. The agency in the Regulatory option has major powers over the users of airport slots. It will also analyse the effect of its initial actions in the market place, and adjust sacrifice rates and other factors as policy needs dictate. We envisage that a 2 to 3 year cycle will emerge of the effects of sacrifice and measures taken to check them. The independence of the allocation function has to be guaranteed. Whether or not this necessitates a separate administrative appointment is discussed in Annex A.

The Agency Coordination Function

645. Following allocation of slots, airlines would trade (free swap) between themselves, exactly as today, except that swaps would be limited to the relevant field. This process is extremely efficient and well practised by the industry. The role of the agency in this operation would be to authorise, record and publish each transaction. This not only gives the agency the necessary transparency of operation, it educates the agency as to the needs of its 'market', and implicitly assists them as they assemble clusters of slots from the slot pool for re-allocating.

646. A major role for the agency in its coordination function, and not universally carried out today, is the monitoring of slot usage. Efficient monitoring is the basis for applying the confiscation rules, which are key to replenishing the slot pool before a percentage mandatory sacrifice has to be specified and imposed.

The Independent Coordinator

647. The importance of these agency functions, and the severity of some of the measures necessary in the Regulatory option, make it essential that the agency is run by a coordinator who is fully independent. The decisions he will be required to make, and the measures to be imposed, make it essential that he or she is regarded as having no interest in the business of any of the airlines or airports involved. Clearly the physical location of the agency must reflect the same principles.

OVERVIEW OF THE MARKET HYBRID OPTION

Introduction

648. A full description of the Market Hybrid option, together with an assessment of how its qualities meet the criteria we have set for assessing options, is contained in Annex B. An assessment of the merits of the option in relation to the criteria laid down in the study Terms of Reference, and in relation to the current system, is at Chapter 7. The Market Hybrid is radically different from the current system, in that it is intended to make use of money. Our first step in the design of the option was to decide how.

The Use of Money

649. Money is a way of allowing the market to decide value. The policy objectives revealed that it was not necessary to extract the maximum price. Selling outright would be feasible. The policy analysis we carried out during Stage One of the study, however, showed that it would not in fact be acceptable to sell the slots outright. The experience in the USA has shown that this would cause a loss of control of the system to an extent which we judge to be unacceptable in the UK and EC. It was thus decided that the sale of leases would be appropriate, to inject a time after which control of the slots would revert back to the owner, the government.

650. *Selecting the Sale Mechanism* - The next step was to decide the mechanism to be used for the sale of these leases. The first option was to sell at a fixed, or posted, price. This was rejected on the grounds that there was not enough information to allow the administration to establish the prices for all the slots. It was also going to be difficult to decide which of the offers to accept at a particular price.

651. The next option would be to conduct a lottery, with each participant paying a fixed price and taking a chance on what was allocated. The principle of the lottery has been used in the USA to inject some instability into a stagnated market. We rejected this option because it was not considered to be a responsible way of assisting a highly regulated industry towards a fairer free market. We had also observed that there was a considerable skill base within the existing coordinating community. It seemed illogical not to exploit this skill in moving to the money option.

652. It was therefore decided that the most appropriate method of sale would be to hold an auction. This would have to be a progressive exercise to reduce the shock to the system. It would also have to include the clustering of slots to ensure that the assembly of viable schedules was not too onerous a task. Once again, we had observed that the coordinators are very skilled at clustering. They would have little difficulty in assembling marketable and workable sets of slots, avoiding having auctions of thousands of lots of slots which subsequently had to be traded into viable clusters, or auctioning a few massive clusters which inevitably had to be broken up into smaller units.

653. The other requirement of the auction was that it had to recognise that the market had already been broken up into fields, to enable the policy objective of allowing various EC and non-EC operations to cohabit the same system. The objective of the auction was not therefore to extract the maximum revenue. It was rather to allow the market to be cleared in an equitable manner, while at the same time giving good information as to the true demand for slots in the various fields. This information would be required by both the administration and the airlines to help formulate their respective short and long term polices and strategies.

654. Further, there is a need to soften the effect on the core business of the incumbent airlines of the progressive sacrifice of slots to auction. Incumbents had to be able to claim ‘Core’ rights, matching a winning price to retain a slot, as explained later. This meant that the auction had to be by sealed bids. Sealed bids had the added advantage that they enable conditional bidding by airlines, such as a bid for lot B if that for lot A has been unsuccessful. Sealed bids also allowed the agency to intervene by matching the winning bid. Both these features were shown to be valuable in the design of a stable option.

655. *Selecting the Type of Auction* - There is an extensive literature on the theory and practice of auctions. We have taken note of the general features displayed by English, Dutch, highest bid, second price and a number of other alternatives.

656. Considering the restraints explained above, we concluded that the second price bid (in which the top bidder pays the amount offered by the next highest bidder) should be rejected on the grounds that it would allow irresponsible bidding by predators. The sealed, highest price bid was preferred because it was straightforward and would produce satisfactory results in the sealed, conditional system needed to make the Market Hybrid work well. We are satisfied that the high skill level of coordinators is well up the task of constructing viable clusters to make the auction a manageable exercise. They will also be well able to work any competently organised after-auction trading activity. We have noted that this is already very extensive in the current system, where some operators have as little as 50% of their demand met by the end of the bi-annual conference. They have to trade the balance before the start of the relevant season five months hence. As a result of the above analysis we are convinced that leases of the slots and clusters should be auctioned using the sealed bid, highest price method.

657. *Viability of the Chosen System* - We have interviewed a number of financial institutions about financing airlines' bids. We have also spoken to those airlines and officials prepared to discuss, non-attributably, money options with us. Both these groups agree that the system we propose would be both viable to finance and practicable to operate. Management would have control of the offers. There would be security against rivals knowing the bidders' strategy before the auction was complete. The airlines who had been forced to sacrifice would retain some initiative by being able to recover 'Core' lost slots at what is, in effect, the second highest bid price because they had not had to bid high themselves.

Initial Allocation

658. The initial allocation of slots is therefore the auction of medium term leases. Auction lots will primarily consist of clusters of slots, assembled by the agency from historical knowledge of their marketability, and each lot will be for use in one field only. The auction will be sealed bids, with the highest bidder winning, but with the proviso that the agency could intervene in the market by matching the highest bid. This it would do if it detected market distortions, or if it decided that slots should be moved from one field to another. This makes official intervention both transparent and quantifiable.

Initial Sacrifice

659. The aim is progressively to introduce slots to the market. At a 20% annual sacrifice rate this would be achieved in 5 years. This would make 7 year leases practicable. Each operator would be required to sacrifice a self-selected proportion of his grandfather slots each season. There would be special provisions for the sacrifice of small clusters and critical network elements.

660. This process would be fairly painless initially. Operators could select unused and low margin slots, or those they thought were of far greater value to them than to others, who could not use them and would not bid. As the years passed the sacrifice would become more onerous. It is proposed that operators would be able to declare an increasing proportion of their sacrifice slots as 'Core'. They could then recover them by matching the winning price, prior to the announcement of the results of the auction.

Trading

661. The agency acts a broker for all post auction trading. It matches sellers and buyers for trades within a field, approves the trade as compliant with the airport's restriction, and publishes the traded price.

662. There are three types of trade: Long Term, where there is a long term transfer of rights. These are normally conducted at the auction every six months, with the seller registering a reserve price; Short Term, where the rights are sublet for a season or a short period; and Same Day, where vacant slots are given to the highest bidder at short notice. A number of procedures are in place to prevent speculation and to encourage full use of slots.

Other Key Features

663. In order to ensure an orderly transition to the Market Hybrid a great deal of power has had to be vested in the agency. Measures have been put in place to control these. A key mechanism in the Market Hybrid is the use of annual rents. These will be related to the capital value of slots as realised at auction, (about the same as the cost of sevicing this capital value), and will be charged to the lessors. The effect of these rents will be to reduce the prices that airlines are prepared to bid at auction. They would be reviewed according to a published formula, probably every two years. Rents do not reduce the

overall cost of a slot, but spread the costs through the lease term and discourage speculation.

664. Annual rents will also be charged to operators of services in the bilateral field. These operators are not subject to sacrifice and are not allowed to enter the auction. They will however, be charged a rent equal to the annual rent plus the imputed capital cost to an EC operator using an equivalent slot.

FIELDS REQUIRED BY THE MARKET HYBRID

Introduction

665. Chapter 5 explains the essential role that fields play in allowing the administration to control the traffic balance in the market. The greater the precision required, the greater the number of fields needed. The full decomposition of fields is at Annex C1. The characteristics of all the practical fields are set out in Annex C2, which includes their detailed definition and the rules concerning the major aspects of their operation. This section lists the particular fields needed to operate the Market Hybrid option, with an explanation of their use.

Considerations in the Choice of Fields

666. In principle it is desirable to have as few fields as possible. As explained in Chapter 5, the free market would have only one. The Market Hybrid requires to differentiate between the EC and non-EC. The first argument to be resolved is whether a money option has to differentiate non-EC operations. The differentiation of the EC market is then considered.

The Bilateral Field

667. We have followed the EC thinking on bilaterals, in that all those who can offer full reciprocity to EC airlines should be granted EC status for slot allocation within the Community. We conclude that all remaining operators will invoke some bilateral agreement to claim their slots. As such they will invoke exemption from both sacrifice and the auction process. We have thus placed all bilaterals in the Bilateral field. They will be charged the equivalent rent to that charged to EC operators for similar slots plus imputed capital costs. They will be encouraged to give up their protection from sacrifice

and purchase, and join the EC fields. The negotiation of both the payment for slots and the transfer is seen to be a major task in implementing the Market Hybrid option, and this is fully discussed in succeeding chapters and Annex B.

Differentiation of EC operations

668. We have considered the needs and methods of differentiating the EC operations. The fundamental mechanisms of charging for slots are simple in this option. The slot costs are related to use. The bilaterals pay the same as the EC. Networks involving Bilateral long haul and fifth freedom short haul within the EC will attract the standard imputed rents. This will be fair and removes the need to construct a special semi-bilateral or network field.

669. This leaves the control of the various categories within the EC. Some authorities have indicated that they will require protection for their carriers. There is no reason why the National field should not be invoked, but we believe that this is against EC policy. It is also not consistent with the intention of the Market Hybrid, which is to move from the present system towards a freer market. As explained below, we have allowed for a Public Service field and we assume that the agency will be able to accept negative (subsidised) bids. This will place such subsidy in the public domain. We have not considered it necessary to use a National field, although there is no reason why one should not be used during the transition, to the point where all the EC nations were satisfied that each was playing to the rules.

670. The policy objective analysis made it clear that there was great anxiety that the premiums which the prosperous long haul airlines could pay for a slot, over those which short haul could afford, would have a detrimental effect. This was supported by almost all the operators we interviewed. We have not been asked to model this process but some idea of the scale of the problem is detailed in Chapter 7. The authorities also expressed a specific demand that new entrants should be encouraged. We have therefore allowed for a field in each of these three categories.

The EC Long Haul Field

671. Remembering that the purpose of this field is to limit the pressure on other fields by limiting the ration of slots dedicated to long haul operations, the dividing line between this and other fields is one of judgement. We expect some friction over the definition because moving an operation across the boundary is likely to change its value markedly.

Operations may be defined by a distance limit. Rules will have to be developed concerning networked flights. The rents and price of leases in this field will set the levels charged to long haul bilaterals. The premium of slots in this field over that which is obtained elsewhere will provide some indication of the cost of official intervention limiting the capacity within this field.

The EC Short Haul Field

672. This field is at the heart of the system. It will represent over 50% of the slots at most congested airports. It will need a wide variety of clusters to satisfy the operators. As the market is progressively freed during implementation, it is to be expected that the trading activity in this field will rise to the levels now seen at the uncongested EC airports. While the shortage of slot capacity remains, it is to be expected that there will be constant pressure to extend the definition of the range boundary and allow the transfer of slots from this to the Long Haul field.

The Small New Entry Field

673. It is argued in Annex B that with the Market Hybrid there is no need to make special provision to aid a well financed established carrier. This option specifically avoids imposing administrative action at the lower level of the system. Carriers are able to bid for slots. Which routes they operate depends on their judgement alone. The policy objectives clearly reveal that some way of helping small carriers to become established is necessary. We have suggested definitions of the SNE in Annex C2, but there is no reason why a more or less liberal definition should not be applied. It is not clear how large this field should be. A starting point of some 5% seems to be the consensus among unbiased observers. The policy will be to erode the privileged protection for the incumbents over a number of years. It will be necessary to ensure that speculators do not bid for these slots, just to sell them on when they are released into the main fields. The major advantage of this field in the Market Hybrid is that the agency does not have to consider which routes the new entry is going to operate. All qualified new entrants will be able to bid for slots. It will be for the winners to decide where they operate. The only advantage the new entrant has is a reduced cost of entry and a temporary relief from the full rents and sacrifice. The difference between the prices in this field and freer ones, will indicate the cost of official intervention in the market.

The Public Service Field

674. Our analysis of policy indicates that provision should be made for a small number of slots to be reserved to public service operations. We have not investigated the number of these which may be needed at the average EC airport. The Market Hybrid does allow negative bids, which would imply the need for a subsidy if that service is to be operated. This will make public subsidy overt. It may also reduce the need for public service slots by indicating those times when such services can be operated most cheaply.

The Others Field

675. This option allows all other categories to be grouped in one field. This includes random operation by charter, cargo, general aviation and for engineering positioning. Most of these are likely to be satisfied by the short term trading market but if a real demand is identified, and it becomes policy to support this type of operation into congested airports, this field would provide the necessary means.

Summary of Fields Needed

676. The full analysis in Annex B of the Market Hybrid option shows that all the objectives can be met with these six fields. Sufficient control can be maintained on the free market to ensure that the policy objectives can be met, and that the system will be stable and only contain a manageable degree of internal tension.

THE ROLE OF THE AGENCY IN THE MARKET HYBRID

Introduction

677. The Market Hybrid option deals with large amounts of money. Although these are no more than the monopoly rents which are currently created within the market, these rents will now be obvious. This is of course the main purpose of introducing money into the slot allocation process. This use of money will necessitate a more clearly defined set of rules. Airlines will be able to quantify their hurt if there is a dispute, and the use of money will make the cost of official intervention clear to all. The temptation for the authorities to interfere by changing the rules will be great, which is another reason for clear, published terms of reference.

678. The three tier structure described in Chapter 4 is universally applicable to slot allocation. In the Market Hybrid the lines have to be carefully drawn between them. There are certain extra functions required at each level.

The Agency Policy Function

679. At the policy function level the mechanisms will be put in place to allow the option to function. A framework of international law will have to be constructed. Within the EC this will be comparatively straightforward. The large number of bilateral agreements, which have to be negotiated under the framework of the various international treaties, will make the process complex. We have constructed the bilateral field to mitigate this problem but we do not underestimate its importance.

680. The policy function will also be responsible for overseeing the relations with other interested parties. It will endorse the airport capacity calculations and rules. It will liaise with the users, representatives of the airports and the airlines, and with the EC and other international bodies. It will take an interest in the fair interpretations of the rules at sister organisations.

681. We have been required to assume that the hundreds of millions of pounds which may be generated by sales and rents will be taxed away. Even if this were modified so that the money returned to the system closer to the point of extraction, (such as a refund to each passenger), the investment decisions would impose heavily on a number of government functions. With these responsibilities we feel that it would be appropriate for this policy function body to be within the government organisation in most countries. The role of finance and the orchestration of the traffic balance at airports is a matter of policy; the authorities would certainly demand a say in these issues. If this was not an acceptable solution then a separate agency would have to be set up. We feel that there is a danger of this becoming too large for the fairly straightforward task we have given it to perform. There is also a danger that it would be overwhelmed by the EC, which may feel forced to step into the political vacuum.

The Allocation Function

682. As is shown on Figure 6.3 the allocation function performs the same duties as the airport allocator today. It is at this level that airlines are given their rights. They may then trade these rights to achieve the schedules they require.

683. In the Market Hybrid fields have to be set, auctions have to be run, and the agency has to act as broker for all long term trading. These extra responsibilities will require the establishment of dedicated cells to perform each of these duties. They will require to have not only the systems to operate the elements, they will also have to have the expertise to accept the policy directives and translate them into practical economic models. Only then can they decide the exact sizes of the fields, the nature of the clusters and the rents to attach to each slot.

684. The most contentious issue will be that of entering the market to move slots between fields. Similarly, fixing of transfer premiums when airlines wish to do this, at times when official policy would encourage this, will also demand skill. The allocation function will need a framework of law so that it can act as arbitrator in cases of dispute over either the actual allocation process or the operation of the coordinating function.

685. The rest of the operation is in line with the current operations. We see no reason why the skilled personnel should not be able to adapt to these tasks. We are convinced that the allocation function should be independent of both governments, air operations and airports. It should take its public policy directives and interpret them in an open manner.

The Coordination Function

686. The coordination function in the Market Hybrid acts in the same manner as today, with the addition of responsibility for short term and same day trading, where the rights of slots are only temporally transferred. The task of recording the actual use of slots will also be more onerous than the rather relaxed methods we found in operation in most countries.

687. The primary tasks of the coordinator will also include advising the auction cell as to the most practical balance of clusters within each field. As is explained in Chapter 4, the clusters exist to assist the orderly operation of the auction, and to reduce the amount of trading needed after the auction to allow airlines to construct this schedule.

688. Although this trading is conducted by the allocation function, the final approval of a trade rests with the coordinator, who has to certify that the buyer's operation does not breach the airport's operational rules. This, and performing the same task on short term trades, will remain significant tasks for the coordinator.

689. The case for a fully independent coordinator is convincing in our view. Airlines will come to him with rights granted by the allocator as a result of the auction process. The coordinator's job will be to agree modifications to the actual times to assist the airlines. The imposition of fields will make his job more straightforward in many ways because he will be faced with fewer radically different services.

690. The judgement as to when a trade is acceptable from the operational point of view will be more contentious. Money is involved. The coordinator will need a reputation for complete impartiality and a framework of law to support him. He will also need the support of a powerful independent allocator if he is to match the flexibility and speed of the current system in performing the coordination task.

BALANCE OF THE REPORT

691. This chapter has detailed the elements of both options. Many more details, together with the reasoning which lies behind the option construction process, are in Annexes A and B. The chapter has built on the principles described in Chapter 4 and the logic of the use of fields in Chapter 5.

692. The likely effects of the options, and their relative merits compared with the current system, are presented in Chapter 7. The constraints imposed on the construction process are set out in Chapter 8, together with our views on how the outstanding legal issues must be tackled. A strategy to implement the options is in Chapter 9, while what it might be like to be an airline operating the options is at Chapter 10. The critical issues, revealed during the construction process which has developed these two options to their current state, are presented in Chapter 11.

7. THE IMPACT OF THE OPTIONS AND THE USE OF MONEY

INTRODUCTION

701. The two options selected for further study, the Regulatory and the Market Hybrid, have been described in outline in Chapter 6 and are set out in detail in Annexes A and B. In this Chapter, we analyse the impact of each against the objectives set out for them by the Department of Transport. We comment where appropriate on how each support to moves towards liberalisation and draw comparisons with the current system. Before examining in detail the Market Hybrid we look at the general effect of using money, which throws into relief the moderating effect of the Market Hybrid's features.

THE REGULATORY OPTION

Merits of the Option

702. The Regulatory option is an adaptation of the present slot allocation system, its differences being designed to make available opportunities for new entrants and so stimulate competition in the air transport industry. The means by which this is achieved, enforced sacrifice of slots to complement firmly applied confiscation rules, indicates the need for the option to be administered by a powerful agency acting with authority of the EC delegated through the government concerned.

703. The system would start with the free grant of grandfather rights to incumbents, a measure which can be seen as some compensation for the subsequent sacrifice and an acknowledgement of past market forces. Although the sacrifice provisions will be unpopular, they are very necessary for the effectiveness of the system in achieving the policy objectives set for improved competition and efficiency. After the initial sacrifice, which is intended to skim only the marginal holdings of airlines, the enforced sacrifice provisions will only be applied if insufficient slots are given up voluntarily or through penal confiscation. This will protect efficient operators at their hub.

704. The Regulatory option has the merit of being easy to move to from the current system. Compared to the current system, it is based on a coherent logic which will allow movement towards the freer market if policy demanded this. It removes the tensions caused by the rigid grandfather rights. By allocating to new entrants and leaving them to decide slot use, rather than by identifying a particular route, it introduces competition

while avoiding imposing on the lower levels of the system, a cause of resentment by incumbents. We believe it will improve the average efficiency of the system and exert considerable downward pressure on fares.

705. The Regulatory option makes use of the very successful system of slot swapping which exists now in the IATA coordinating and scheduling community. Operating within clear rules, and with all swaps, allocations and sacrifices made clear for all to see, the option will constitute a fair and equitable basis for slot allocation which can be understood by all parties and against which strategic plans and decisions can be made. We have rejected lotteries because of the uncertainty they cause. They are no substitute for clear rules, a known place and status in the queue for each field, and a certainty of a definite number of new slots becoming available each year.

706. The option has the merit of leaving most of the efficient elements in the current system untouched. It only introduces a formal policy function and the overt allocation of slots from clearly defined fields.

Impact on the Airlines

707. Airlines are likely to view our ideas for the Regulatory slot allocation option differently, according to their individual situations. Different sets of winners and losers would result from its sacrifice and re-allocation provisions. Airlines are generally opposed to the major provision of the option, which is a partial erosion (10% initially, and 5% per year thereafter, if required) of their grandfather rights. This is true for most IATA and non-IATA airlines which participate in the IATA schedule coordination conferences. Any sacrifice, however limited and whatever its purpose, is likely to be resisted by the airlines affected. Non-IATA members who are not part of the regular coordination process would doubtless accept the concept of fields implemented to protect some of their interests, but many airlines will view the creation of fields as cumbersome and regard such official intervention as unnecessary. Corporate business, general aviation and cargo operators are examples of potential beneficiaries who are currently restricted through the TDRs. While the Regulatory option can function without filling specific fields, we nevertheless suggest their creation in order to address the fringe operators' specific needs. The explicit beneficiaries of the Regulatory option are the new entrants (small and large) who are allowed, though in a limited way, more access to congested airports.

708. Increased competition will result between airlines on some routes, by allowing new small and large entrants. The fields are not route specific but the sacrifice provisions will open up new slots which will be used in new or established sectors within the fields' coverage area. It remains to be seen if major carriers, when invited to submit candidates for sacrifice, will give up some services on very competitive routes characterised by low profit margins, or shed services on lower volume, less competitive markets, at non optimal hours. We have seen evidence that, faced with sacrifice provisions, both types of reaction will occur.

709. Problems of access implicit in the present system are removed by this option, especially to a number of smaller airlines. The pressure to use slots more efficiently will undoubtedly increase due, among other factors, to the harsh 'use it or lose it' rules. If one wants to quantify the degree by which the market will be opened, the 5 to 10% imposed by the sacrifice provisions give an indication of the forced injection of competition. The multiplier effect of such measures is hard to estimate. With the relatively small adjustments at the margin (5 to 10%) of the present slot holdings of incumbents, we do not anticipate that the Regulatory option would actually bring about drastic changes for the incumbent airlines. No airline's market position will be shattered, but an important competitive edge will be injected into the system. Incumbents will have to carefully assess, manage and correct the existing inefficiencies of their networks.

710. The distribution between long haul and short haul traffic will be affected but will be controlled by the discipline of the fields. Given the stability of most bilateral agreements and provisions and difficulties in changing them, most changes are anticipated in the EC field where competition will intensify. There will be little incentive for bilaterals to enter the EC field. New entrants on bilateral, inter-continental routes will measure pressure to shift slots towards more profitable long haul competitive services at certain congested airports, but the latent commercial demand for long haul out of Heathrow, for instance, is by no means unlimited. The proposed option will control these moves to relatively small increments.

711. The impact on domestic services (especially on thin routes) is perhaps easier to predict, although no modelling was included in Stage Two to quantify the effects in detail. The sacrifice provisions will force carriers to make decisions regarding their marginal operations. If those services are point to point and marginally profitable for the incumbent airlines, they might be sacrificed. The added competition from new entrants might make the economic situation even more precarious if price cutting takes place. On the other hand, thin routes could become a niche for some new entrants operating

with aircraft equipment more suitable to the market conditions. Overall the market impact will be small because of the limited adjustment imposed by the 5-10% sacrifice provisions.

712. We do not expect the distribution of traffic among airports in the London area to be changed significantly. It is expected to keep reflecting the market forces which tend to focus on London Heathrow as a main gateway and interlining terminal. Overspill will move to Gatwick and Stansted. Once more, the overall effect of this option will be small in that respect.

Impact on the Airports

713. No major change is foreseen for the airports following the application of the provisions of this scheme. Certain new fields (eg public service, small new entrants) may imply types of aircraft equipment slightly different from today due to airlines' realignment and specialisation. Relatively minor changes in the utilisation of airport facilities utilisation are expected.

714. The administrative function of allocation will partially change the nature of the interface between airports, scheduling committees and airlines by adding a distinct and independent focus for the allocation of slots. Coordinators will function as before. Airlines' reactions and market moves between long haul, short haul, domestic, etc sectors will cause variations in airports' revenues but the scale of those changes should be relatively small.

Effect on Air Transport Users

715. Most airline passengers should be better off under the proposed Regulatory option which will inject some fresh competition into a number of sectors, and could produce big benefits for the travelling public. Since the recent opening up of Heathrow to two new entrants (American and Virgin) following the entry of United earlier in the year, BA have improved their passenger services to retain the loyalty of their regular business travellers on the high-yield North Atlantic sector. Nevertheless, the short term benefits to consumers might extract a toll from airlines in the medium or long term. In practice, added competitive pressure does not always act in the consumers' interests; fierce competition could eliminate one or more competitors on a route or sector. It is clear that the market pressures will produce increased efficiencies in slot usage and in airlines' commercial behaviour, but the long term effects are less certain.

716. In the short term, the Regulatory option will certainly further the interests of the travelling public at large. Small and large new entrants may increase the level of service from presently unserved or poorly served cities. The public service field will cater for communities presently neglected while slots are used to serve more profitable alternatives. Policy changes suggested in the medium term, to allow cargo, general and business aviation users into Heathrow, speak for themselves, as liberalising the market.

THE IMPACT OF USING MONEY IN SLOT ALLOCATION

Introduction

717. Before examining in detail the particular effects of the Market Hybrid, it is instructive to explore the general effects of using money in the slot allocation process. We speculate on its unfettered use in a totally free market, to highlight the controlling influence of the measures we have proposed for our Market Hybrid, the examination of which follows.

Financial Institutions

718. Using money in the slot allocation process can be expected to have a far-reaching effect on the air transport industry and those connected with it. First among these are the financial institutions, the banks and leasing companies which enable the industry to function, and we have spoken to these during our work.

719. In pure finance terms many elements of the airline industry seem poorly placed. Many airlines have debt/equity ratio far higher than would be acceptable in other areas of commercial activity. Much of their equipment is leased, both to keep it off their balance sheets and to provide lenders with a fixed asset as security. They have a low return on both capital and turnover. Their profits are crucially dependent on growth and the maintenance of high load factors. By any judgement most of the industry is very overgeared.

720. Some airlines' aircraft are ageing and the demands for capital to replace them cannot be met out of projected income. To add to this, the downturn in the market, which has brought relief to the slot shortage, threatens to make a marginal financial situation critical.

721. Taking the long term view, charging for slots will be neutral if the money extracted is invested in facilities which reduce the shortage and increase the efficiency of the industry. This study has had to assume that all the proceeds will be taxed away. Costs will therefore rise unless efficiency can be increased to compensate for the taxation. If costs rise, traffic will fall. Marginal operations will fail or be withdrawn. Demand will equal capacity.

722. From our researches we believe that the financial institutions are likely to view this in a number of ways. Those which are lending against the equity of the airlines will view the market for slots as a method of increasing the real equity by fixing the value of an asset which is currently at the gift of the authorities. The recent activity over the purchase of US rights into Heathrow has given some credence to slots currently having a market value for equity, but the restriction of BA's frequencies to Tokyo has eroded this.

723. The financial view would be much the same whether slots were gifted and then traded, or just sold. The asset base of the airlines would rise, allowing them to borrow more. It would of course show that their performance was worse than is now evident against return on capital. To keep their rating against other competitors for money, they would have to increase their profits by more than that needed to pay for the loans. Borrowing may become more expensive, but in general, if the equity/debt level remained satisfactory to the banks, the financially strong airlines could borrow more from the banks than the cost of the slots.

724. The alternative scenario is where airlines now choose to lease equipment. They are likely to choose to do the same with slots. A lease would have a 7 year life and a trading value. There is no reason in principle why it should not be a leasable asset. Unlike an aircraft, the lender would at least know where it was if he wanted to repossess it.

725. Financial institutions have expressed an interest in acting as pure brokers. Indeed we considered and rejected this as an option for the agency, because in this option the agency is an arm of policy. In a freer market there would be no reason why the agency should not operate in the private sector. Some airports consider this role is naturally theirs.

726. Concern was expressed that banks could not underwrite airlines as they bid in the market. The banks might find themselves bidding up the price against each other, without regard to the intrinsic value of the slot as a profit generator. The banks will have

to transfer the hard lessons they have learnt from the recent property booms and slumps in the US and the UK. On balance there seems no reason why the capital needed to buy slots should be difficult to raise. It will be cheaper for the well financed airlines. They can add the value to their equity. This is no more than the free market at work favouring the prudent or the lucky.

Valuation of Slots

727. We used three different methods to derive values for slots during Stage One of the study. We inferred values from actual transactions, we applied the principle of a payback over 12 to 18 months through operating profit of a slot acquired from a takeover, and we applied US data to the European scene. For illustration, because the data is readily available in this form, we categorised slots by market: UK domestic, short haul (both EC and non-EC) and long haul.

728. For highly sought after long haul slots at Heathrow and Gatwick, likely values vary from £6,000 to £14,000 per aircraft movement. Typical slot prices for domestic UK operations are estimated at about £500 per movement. Short haul (EC and non-EC) slot prices vary between £1000 and £1500 per movement.

729. Recent comparable data in the USA show that the market rate for particular desirable (domestic) slots (for 250 days) is now in the range of $1 million to $1.7 million each (reference 9) which would equate to about £2500 to £4250 per aircraft movement. They are so valuable to a carrier's strategic power that airlines lease them out rather than lose them through straight sale. Rates for 6-month or a year lease vary between $12,000 to $15,000 a month or about £100,000 per year (8 to 15% of capital value). Another study for the US FAA produced an estimate of an average slot price of $850,000 (or £2100 per single slot) for US domestic slots at High Density Rule (HDR) airports, giving a total value of all air carrier slots at the four airports of around $1.8bn, (reference 10). In Stage One of the study we estimated the total capital value of the slots at London Heathrow and Gatwick at about £1bn. All findings point to the significant hidden monetary value attached by the private airline sector to their currently gifted grandfather rights.

730. *Implications for Airline Costs and Fares* - Using the above assumed figures for Heathrow and Gatwick and the average cost/revenue functions for UK, EC and international services, we calculated the fare increases that might result if the airlines directly passed on the full additional cost to users. The effect on fares would be an

increase of 5%, 8% and 9% in the UK domestic, EC and international sectors, respectively, at constant profit margins. This 5 to 10% increase in fare is lower but in accordance with the trends developing in US HDR airports where an average increase of 15% in average fares has been noted (reference 10). We believe the variation is due to different cost and revenue structures between Europe and the US, but the trend to higher fares is significant.

731. *Maintaining Market Share* - If the airlines did want to maintain their present market share by not penalising the passengers through increased fares, the present profit margins would be melted away by the costs of the slots. In the long haul, up to 90% of the profits realised in this sector (highest yield) might be absorbed. The profits generated (with a lot of hard work) by the most successful UK domestic carriers will be eroded by up to 25%. A significant part of EC operations (marginally profitable at best) will turn into loss making services. The implications of our analysis are clear. Only established long haul operators on high yield sectors would be able to bear the added financial burden, together with some resilient domestic carriers. EC operations would be severely disrupted under this scenario of 'frozen' fares. The industry would have to change.

732. *Change of Use* - We can speculate on potential shifts of slots between categories and assess the consequences. If we assume, for example, a massive market migration of all short haul EC slots into the highly priced long haul field, fares would have to double to maintain current (and relatively depressed) profit levels. This is an unrealistic worst case scenario. Heathrow is unlikely to generate enough international traffic demand to become a 100% long haul, international, non-EC traffic base where EC carriers would have to buy their slots for EC operations at long haul prices. The situation is even worse if domestic carrier had to buy their slots at long haul prices and keep their current profit margins. Then a rise of 150% in fares would be necessary to carry on business. We are obviously describing the system under the worst theoretical conditions, but some businessmen and observers of the industry predict that this is exactly what would happen.

733. Whereas inefficient use of slots and limited access would be a thing of the past, these may be replaced by a new set of constraints where financial might plays an even greater role than today. The airline industry in Europe would enter a phase of transition. The market forces of economic efficiency, the effectiveness of an airline's global strategy and the rapid exposure of business mistakes might create a revolution in the European air industry similar to the de-regulation in the USA of the last decade. Effects of the economic impact on the air transport industry were not to be formally quantified in Stage

Two of this study, but it is clear to us that a careful assessment of those has to be carried out in detail before suggesting any replacement of the present non-monetary system. We have completed this preliminary discussion of a worst case unfettered market scenario to show how alarming are the consequences for the airline industry and the travelling public at large. This is why we believe our gradualist approach to a controlled Market Hybrid is the only practical one.

THE MARKET HYBRID OPTION

Merits of the Option

734. Although the Market Hybrid option introduces money for slot allocation, it allows for a fairly detailed level of intervention so that the authorities can ensure that their policy objectives are met.

735. Although in its uncontrolled form it poses great difficulties, the introduction of money into the system is a necessary step change on the path to a free market and the full liberalisation of air transport. We show in Annex B the method we have used to analyse the effect of each sub-element before we introduced it to the architecture. The resulting option is, we consider, well balanced in the market, low in tension and stable. As such it should be possible to adapt it to any policy change which demanded a move towards either a freer market or a more regulatory regime.

736. We have constructed the option so that the transition from the current system is not only gradual, but is also adaptable if it is seen to be generating undesirable side effects. To achieve this we have had to grant the agency a great deal of power. We have put in place the checks and balances to control this power, making the procedures transparent and public wherever possible. We think this is an improvement on the rather secret procedures sometimes adopted at the policy and allocation levels under the current system.

737. Although the option will not extract all the monopoly rents which are inherent in the current system, it will reveal much more clearly the true demand for various types of service. The grandfathers will have to decide on the value of their current slots as they are sacrificed, and when they should declare them 'Core', in order to recover them. The 'Core' recovery principle protects efficient operators from the destruction of key elements of their business, for example at their hubs. The option will also reveal the true

price of official intervention, by showing the difference in price between similar slots which the agency has placed in different fields.

738. The monopoly rents extracted can be identified as the value the market places on the shortage of slots in any congested airport. Although the study had to assume that these would be taxed away, we feel that even this would make it easier to identify the priority for infrastructure investment.

739. The option provides a more logical process for the entry of new entrants than does the current system. The administration has only to decide on the size of the Small New Entry field. It then decides who qualifies. After that, the auction process will decide which operator has the most efficient operation and has identified the most profitable point to enter the market. The official intervention is minimal. It also avoids the need to intervene at the detailed route level, in the manner proposed by the EC, and as practised recently in the UK in the case of the Tokyo route. This latter illustrates the highly regulatory nature of most bilaterals.

740. The problem of bilateral agreements combined with a money option is addressed by the use of a special bilateral field. Bilaterals will not suffer sacrifice or take part in auctions. We think the option supports the EC proposal that those airlines which can prove full reciprocity can join the EC market, since they will be able to move out of the bilateral field into an EC field and enjoy its greater size and scope.

741. We have proposed that bilaterals should be charged a rent which combines the rent paid by EC operators, plus an imputed cost of the capital cost of the lease. This is fair. It will solve the problem imposed by the principle of impartiality, but the power of the EC will undoubtedly be needed to prevent retaliatory action.

742. The use of the single till depresses landing charges and creates an obstacle in the 'fair and reasonable' clauses of international agreements. This could be avoided if airport companies were confined to direct aircraft operations. We think that charges would rise towards the levels which may result from the auctions, making the proposed option less contentious. This Market Hybrid option would be well adapted to such a move.

743. Using money, the option needs very fierce provisions against the build-up of monopoly or the speculation in slots. By making the agency the broker for all trading, hidden secondary trading, which we think will continue to grow in the current system, will

be suppressed. The option does not allow uncle/nephew relationships to develop. We believe these are anti-competitive. They have been seen in the USA, where large airlines not only act as brokers but determine to whom they will grant sub leases.

744. The Market Hybrid option will not necessarily solve the congestion problem but it will allow allocation to be decided on more logical commercial grounds. It will allow the authorities to intervene if necessary, but will at the same time discipline them. It can be reached by a gradual process from the current system. Its great merit is that it can be adapted to any move either towards the free market or one calling for more intervention than our Stage Two remit assumed.

Likely Effects of the Market Hybrid

745. *Financial* - Because the industry is so under-capitalised and over borrowed, we have reduced the capital requirements by adding a variable rent to the lease. We have related this to the slot auction value to discourage hoarding and speculation. The total costs over the life of the lease will be the same but this arrangement will assist the weaker carriers. Of particular concern was the need to balance the financial power of the large international and nationalised carriers. It is to stop these from gaining unfair advantage from their cheap sources of capital that we have developed the strict rules that they stay in the bilateral field until they can prove full reciprocity with the EC. We also suggest that the agency should have the power to restrict the proportion of slots in any field owned by a single airline or consortium. Even then there are indications that the well capitalised, low geared, long haul foreign airlines could dominate a free slot auction. The policy objectives demand some protection. This is provided in the Market Hybrid by the imposition of the EC long haul field.

746. *Change of Use* - While the effects of the Market Hybrid will not be as dramatic as those in an unconstrained market, the distribution between long haul and short haul traffic will definitely be affected by the Market Hybrid system. If the size of the long haul fields is not controlled, we can speculate that the present airline preference towards Heathrow will accelerate and might result in up to 50% more long haul international (non EC) traffic. This would translate into a 25-30% international long haul market sector share if the latent demand was allowed to stabilise at market prices.

747. On thin routes the impact is predictable: if the increased slot costs are passed on to the consumers, most of those will be curtailed unless the passengers accept the fare increases. This type of route could also become a market niche where specialised

carriers (ideal aircraft size, 'no frills' service, etc) might succeed. In terms of the distribution of traffic among airports in the London area, we expect a lot of airline re-deployment and network changes as a result of the Market Hybrid provisions. The added slot premium on London airports as Heathrow and Gatwick will force some airline network and market re-structuring. The market will put a premium on accessing Heathrow during peak hours. This will force the airlines to abandon such slots where their services are only marginally profitable. The short haul market will be affected. Some regional airports will benefit from higher slot prices in the London area. The consequences of similar measures have already been analysed, namely in the CAP 570 (reference 11). That particular study examined the impact on the traffic distribution in passengers and air transport movements under a large number of scenarios for the London area airports, for certain regional airports and for the United Kingdom as a whole. Two of the scenarios (nos. 11 and 12) are relevant to this study: (11) a fixed charge per air transport movement used to regulate traffic within the existing capacity of the London airports (differential airport pricing similar to slot pricing) and, (12) fixed charge per ATM plus a relaxation of terminal constraint at Gatwick and Stansted.

748. *Effects of Prices on Traffic Demand* - Some of the trends revealed by the CAP 570 analysis apply, in part, to the Market Hybrid slot system. A few highlights are discussed here, but the reader is referred to the CAA work for a thorough discussion of the impact of price increases. As expected, London Heathrow's long term share (2005) of domestic flights goes down substantially to the benefit of long haul operations (+50%). Short haul traffic (intra-EC, EC to Eastern and Western Europe, North Africa and Israel) is not affected substantially. Gatwick also shows a significant increase in long haul traffic at the expense of short haul operations. Domestic growth trends are relatively unchanged. Long haul movements by 2005 out of Stansted are significantly reduced, to the benefit of domestic services. Short haul movements at Luton increase by 100% compared to the existing numbers.

749. In CAP 570, the total number of passengers forecasted for all regional airports for scenarios 11 and 12 actually decline compared to the base case (present London area capacity). The reasons for this are not presented in the summary document provided. It is noted is that the analysis was conducted under the TDR regime then prevailing and existing capacity limits, and that much has changed since. Charge increases of £450 to £1750 per aircraft movement were estimated by the CAA model (at 1987 prices) to clear the market at Heathrow. The model assumed that these charges would be passed directly and uniformly to the passengers concerned. The caveat is also made that these charges should not should not be taken as an indication of what airlines might be

prepared to pay for slots. Nevertheless, a sophisticated analysis framework and tool for the assessment of slot prices on traffic trends already exist within the CAA. We believe that the specific assumptions and parameters of the Market Hybrid option could readily be applied to that method, but no time nor resources were included in Stage Two to cover that specific aspect of the problem.

750. *The Stabilising Effect of Fields* - The consequences of free market conditions affecting airline costs, fares and passenger revenues do not apply directly to the Market Hybrid option. The free market forces are kept in check by the intervention of the independent allocator (auctioneer) and the construct of fields. Free market demand for slots will be able to express itself through the market mechanisms (auction) but a dampening of the system is provided by the segmentation of the demand into specific fields. The allocator also holds tremendous powers through his potential interventions in the market place. He can buy and match the highest bids if policy implementation requires it. This is a powerful role analogous to a central bank. The control of this administrative power is discussed elsewhere.

751. *The Stabilising Effect of Policy* - Policy objectives in a Market Hybrid system do not call for the extraction of the entirety of the incumbent monopolists' rents. The evidence suggests there would be some increase in airlines' operating costs. The option controls these costs and inhibits rapid movement between fields. It also prevents speculation in slots and the domination of any field, and confines airlines exploiting privilege to the bilateral field.

Impact on Airlines

752. The Market Hybrid concept is so far removed from current practice that many airlines could scarcely be brought to discuss it rationally. Most IATA and non-IATA incumbents are totally opposed to the concept of money transactions for slots in the air transport system. They claim that money could unleash huge and unpredictable forces in the market place, especially from carriers for whom the price is secondary compared to the final strategic objectives of maintaining or opening access to key (congested) airports. Some State and powerful private carriers belong to that category and are feared most by many other incumbents, especially when business is poor. The cyclical nature of airline business and its overall financial fragility has been observed previously. We think that a sudden jump to a pure price driven slot market could provoke financial mayhem in the industry. The evidence to that effect is clear, and we presented it in our earlier Stage One analysis.

753. We know, however, that some airlines would be willing to participate in a monetary system as proposed in the Market Hybrid, even though this may not be the official line. Some airlines recognise the asset value of their slots on a balance sheet. Secondary trading is happening in the USA and the idea is being explored in Europe. Evidence of slot swapping for value is naturally impossible to gather, but value considerations, if not money, are known to be sometimes used in order to facilitate some slot transactions. The implications of putting a trading price on a slot in the secondary market automatically carry right up to the initial allocation level, whether the slots were initally sold or gifted. Immediately, the entirety of slot holdings of an incumbent airline, based on the limited number of slots it would trade on the secondary market, is susceptible to be assessed by those who recognise saleability of assets.

754. Incumbent airlines will also be opposed to the 20% sacrifice of slots to the auction every year to put all their slots into the market within 5 years. The harshness of the measures is tempered by the Core protection provisions. The option is likely to be fiercely resisted on those grounds by the present winners in the system.

Impact on Airports

755. The airport charge system presently in place would not need to be legally modified if the Market Hybrid option were to be implemented independently of airport authorities. The Airports Act of 1986 will need changes if the government wants BAA plc to be involved in the collection of additional slot charges. We do not recommend that approach. Slot rents and capital prices will be, in principle, managed by the independent auctioneer and trading function of the administration. Special legislation will be needed to allow the increase of overall charges to aircraft operators above current BAA plc's levels which are intended to be just, reasonable, and non-discriminatory, and to reflect fully allocated costs. These are currently heavily subsidised by having to include concessionary rents within the single till calculations.

756. The administrative function of allocation will be run by the independent auctioneer and, as such, will modify significantly the interface between airport authorities, scheduling committees and airlines within the auction process. Coordinators will function as before.

757. Airlines' reactions and market moves between types of operations (eg long, short haul) and airports (London, regional) will follow the patterns discussed above. This will

have an impact on the present revenue streams of the airports. The magnitude of the economic effects has not been assessed because such modelling was beyond the scope of the present study.

Impact on Air Transport Users

758. We have already evaluated the potential fare increase to passengers in the Market Hybrid option. Assuming the airlines pass on to their end consumers all the additional costs the fare increase could be between 5 and 10% depending on the sectors flown. Long haul will be more attractive to airlines than short haul and the trends are clearly shown: this slot option will introduce a premium of a few pounds per passenger to fly at peak hours for EC and UK services, and on the long haul routes, a few tens of pounds will be added on the ticket. The elasticity of business travel demand with respect to price is relatively low. In the leisure market though, the impact could be drastic. Using a typical elasticity value of demand of -0.7, a 10% increase in fares will produce a 7% fall in traffic. Extracting $1bn/year in Europe would add 4% to fares and cause a 3% reduction in traffic, according to some sources. As already mentioned, the total capital value of all the slots at only Heathrow and Gatwick represents about £1bn. Rents might generate between one and two hundred million pounds per year.

759. The user community can be expected to oppose strongly any market option which will drive up the cost of travelling without any perceived short or medium term improvement in the level of service. As far as the end users are concerned, the use of the proceeds (another passenger tax) is a key factor in the consideration of any monetary scheme. We believe that the present proposal to tax proceeds away is unlikely to be acceptable. Only if proceeds are seen to be improving the air transport ground or air infrastructure and services, and expand the capacity of the system, are users likely to be satisfied.

760. Because we have not been able to quantify any increases in efficiency, we have had to assume that all the increased costs will have to be passed on. In these circumstances, the effects on the air transport industry of the Market Hybrid option will be in the short term an increase of airline operating costs, and a decrease in passenger traffic if airlines cannot avoid passing on the slot charge to users. Alternatively, airlines vying for market share and absorbing the additional costs will incur substantial reductions in their profit margins, the more so in the short haul intra-EC services.

761. The Market Hybrid will extract lower monopoly rents than the full £1bn which we believe exist in a totally free market environment. The present study excluded a detailed modelling of the financial and economic impact of the proposed system on the airline industry and we have therefore been unable to carry out a full analysis. We have learned enough to convince ourselves that the consequences of the Market Hybrid option require a detailed look at some critical factors (see Chapter 11) if the option is to have any chance of success.

8. LEGAL ANALYSIS

INTRODUCTION

801. In Stage One, the Legal Adviser in the Department of Transport provided a briefing on the legal framework within which the current slot allocation system operated. He highlighted the key legal issues which would have to be addressed if the system were changed.

802. We took note of these issues during the construction process. Both options contain elements which are aimed at avoiding or overcoming the problem areas. With radical change, however, it is inevitable that the legal framework will have to be modified. To identify these critical areas, we submitted the outlines of the options developed in Stage Two to the Department of Transport Legal Adviser for analysis.

803. This chapter contains the result of that legal analysis, and identifies the elements they judge as significant. The text is largely verbatim, being only lightly edited to retain the basic arguments. As a result of this advice, we have been able to modify certain sensitive sub-elements of the options to avoid the problem identified. Some of the advice is therefore now irrelevant, although it is valuable as a record of why the changes were made, and as a marker to why we should not revert to the original feature.

804. At the end of the chapter we have included a section which explains how we consider we have addressed certain problems. We support the view that the legal framework will have to be modified by a coordinated programme of negotiation, to allow for the introduction of modified options of the type we propose.

THE LEGAL OPINION

805. A careful examination of the two options by the Department of Transport Legal Adviser and FCO Legal Adviser reveals the following legal implications (reference 8). The legal scene has to be set against the following premise: a 'new' system of slot allocation will be enacted by EC secondary legislation, directly applicable to the UK. This may either provide for a private body to perform slot allocation, with or without supervision by government, or for the appropriate government department to do so directly. In either case the system will be guaranteed in EC law with appropriate recourse for aggrieved airlines.

REGULATORY OPTION

Fields-Ring Fencing

806. Leaving aside the practicalities of developing 'fields of slots' both in the contexts of real aircraft operations and of compatibility with slot allocation at the other airport, it would seem that a development which does not discriminate on the ground of nationality of an operator will not fall foul of the basic provisions of Articles 11 and 15 of the Chicago Convention, but development may be inhibited by the usual bilateral provision for "fair and equal opportunity". The division of all available slots could not properly, according to the legal experts, reduce the quota available so as to deny a national carrier the ability to use the same airport as its competitor where that has been enjoyed previously. If that occurs retaliation may be expected, especially as regards services to non-EC destinations.

807. The division of an airport's available slots into fields, each with a restricted category of airlines able to seek slots, in accordance with EC provision appears to create a distinction as between aircraft of one nationality and aircraft of another, contrary to Article 11. The Convention nevertheless recognises certain distinctions. Scheduled Air Services are treated differently from non-Scheduled Services. Indeed this is recognised specifically by Article 15 itself. General Aviation could also be distinguished.
An "air service" is defined in Article 96(a) of Chicago as meaning "any scheduled air service performed by aircraft for the public transport of passengers, mail or cargo". There is, therefore, no distinction in Chicago between passenger and cargo services. However, State practice with bilateral air services agreements discloses a separation between passenger and cargo operations. Such a distinction should be readily understood by the international aviation community.

808. Access to an airport which is determined on the basis of a field type by reference to route type may also be claimed to be discriminatory on national grounds. This is why none of the fields is created on that basis.

809. It seems that a judgment of a field's discriminatory effect must be influenced by the degree to which members (operators) of each field or set can be identified in advance. If there are too few, this will attract charges of discrimination. If there are many, the field may be acceptable.

810. Clearly some means must be found to encourage new entrants and break down monopolies of slots to foster competition. A distinction based on size of the new entrants may well attract censure from the airlines of emerging States, and from some of the UK domestic operators. It may be better to have a single category of new entrants but have identified policies which will favour large or small carriers in different circumstances.

811. Regarding the long haul and short haul fields it could be argued that there already is a clear distinction in treatment of these due to time zone constraints on long haul operations. The categories are admirably broad. Inevitably, however, short haul operations will be primarily intra-EC. Were the short haul field operators to be given a more favourable allocation through regulation/pricing than those airlines with proportionately less short haul services the latter may consider they have been discriminated against albeit on a macroeconomic level.

812. The same considerations apply to thick and thin route fields. There are possibly enough operators from enough States to insulate the thick route field from challenge. Given the amount of competition on those routes, subject always to "fair and equal opportunity" constraints, it may be acceptable to treat them differently. It is certainly worth floating as a concept to be debated by the EC institutions. The thin routes will inevitably involve services to a wide number of States. UK bilateral commitments will need to be secured by giving some protection to thin route operators in the way that the current system appears to.

Sacrifice

813. The taking away of slots is likely to be highly controversial and, especially as regards services to non-EC destinations, likely to lead to retaliation. Enforced dispossession on an arbitrary basis is most likely to prove to be unacceptable and it is not realistic to expect a measure in such terms to proceed through the Community. It seems the agency will need to have criteria by which it establishes from whom sacrifice will occur, being criteria which do not discriminate on nationality grounds.

Confiscation Provisions

814. The 'use it or lose it' rules will require exemptions in order to be workable. Account would need to be taken, for example, of air traffic controllers' strikes which make services impossible to operate as planned. Emergencies which result in State

aircraft using an airport, denying civil aircraft their planned use would also need to be catered for. All 'use it or lose it' provisions are, of course, built around sensible operational criteria of use. They have been used in the past, but to a varying degree of severity. The principle is not contested; the degree of application, however, is likely to be.

Re-allocation

815. Care would need to be taken to ensure the criterion for re-allocation of slots was not discriminatory on national grounds. There remains a risk that a criterion based on preference for particular operations may be regarded as discriminatory, especially if a carrier desiring to serve non-EC destinations is denied entry because of a preference for intra-EC operations. It seems that an EC proposal would require the setting out of transparent criteria for allocation; arbitrary allocation is not likely to be acceptable.

MARKET HYBRID OPTION

Charging Provisions of Chicago Bilaterals

816. The charging provisions of Chicago-type bilateral (eg UK - Netherlands 1946 and UK - France 1946) reflect Article 15 of the Chicago Convention. The relevant provisions read as follows:-

> "Each of the contracting parties agrees that the charges imposed on the designated airline or airlines of the other contracting party for the use of airports and other facilities shall not be higher than would be paid for the use of such airports and facilities by its national aircraft engaged in similar international services." (UK/France Article III).
>
> "The charges which either of the contracting parties may impose, or permit to be imposed, on the designated airline of the other contracting party for the use of airports and other facilities shall not be higher than would be paid for the use of such airports and facilities by its national aircraft engaged in similar international services" (UK/Netherlands Article 3).

817. An open system, such as an auction, free market leasing with onward lease in which airlines can bid with the successful bidder being allocated the slot, would not appear to contravene the above two but the failure of a State to ensure charges are no higher for

the foreign airline in the context of the home airline perhaps possessing better knowledge of market conditions and greater market access may prove problematic. In addition, tariff systems (eg purchase price, rent setting) may meet the standard set in Article 10 of Bermuda 2 which provides in part that

> "Each Contracting Party shall use its best efforts to ensure that user charges imposed or permitted to be imposed by its competent charging authorities on the designated airlines of the other Contracting Party are just and reasonable".

Trading

818. The auctioning of leases, with a fee for transfer between fields, has the difficulties that:-

- It will likely lead to airport charges for the carrier of one nation being different to the carrier of the other with the consequent risk of a breach of Article 15 of the Chicago Convention, particularly since HMG will not have done anything by way of ensuring that charges for the carrier of the other nation were not higher than its own.

- It may lead to a denial of the fair and equal opportunity provision in bilaterals particularly as regards poorer airlines and nations.

- Since it is based on the market value of the slot, it will not possess any relationship to the costs of running the airport itself and will therefore likely not accord with the user charges provisions in the Bermuda II agreement and will also depart from ICAO guidelines.

The Agency Functions

819. There is an issue over the need for the CAA to have a role in agreeing an agency's rules. In the context of an EC regulation, it would be for the agency to meet the criteria set by the Regulation and to answer to the Commission for any failure. Slot discussions and exchanges would continue to need Article 85(3) exemption.

820. As to the Policy Function it seems that, set in the context of an EC proposal, slot allocation will need to accord with criteria established by and/or to the satisfaction of the Commission rather than individual EC States.

821. Again in the context of an EC proposal, the legal experts would expect the agency to operate according to criteria with an arbitral procedure to determine disputes so that the concept of users agreeing to policy terms of reference would not arise.

822. Such criteria would, of necessity, need to be reasonable if the rigours of Article 86 are to be avoided. Unfair confiscation and allocation rules implemented by an airport operator are likely to run the risk of being incompatible with the common market. One may not expect the Community to propose a slot allocation Regulation which inherently ran the risk of causing airports to abuse their dominant positions. Such a Regulation would likely be challenged.

Fields - Ring Fencing

823. A special field created for small new entrants only is most likely, in the case of the market hybrid option, to give rise to disparity in charges when compared with other users of the airport. This would be contrary to Article 15 of the Chicago Convention.

824. Fields cannot specially be designed to secure that certain operators are protected from paying high prices. That would appear to be inconsistent with Article 15 of the Chicago Convention.

ACTIONS PROPOSED ON LEGAL ISSUES

825. The legal analysis confirms the inherent difficulties in modifying an historical 'cartel' system supported and protected by governments and airlines in order to provide a stable framework for the conduct of air transport activities throughout the world. Some market sectors have already 'liberated' themselves and operate under different rules in their own sphere of influence. International air services are usually privileged operations carried out under an elaborate set of conventions and agreements. The field concept proposed in this study is a means to preserve the legally binding status quo provisions, while offering a pragmatic way out of bilaterals. They have been an important instrument in the fostering of air commerce, but the possibilities opened by the Treaty of Rome in the European Community and the recent moves towards air transport liberalisation require a legal framework different from that now in place.

826. In the proposed options, foreign carriers would not be discriminated against on the basis of nationality but they would be categorised on the nature of the specific legal agreements they wish to invoke to obtain their slots. If they decide to operate under the present bilateral agreements, there is no change for them in the Regulatory option. In the Market Hybrid, they will pay rent equivalent to other carriers' charges for the same type of operations. The only problem is to meet the criteria laid out by Article 15 of the Chicago Convention, in charging cost related (reasonable) fees. If countries want to join the EC fields and offer full reciprocity of treatment to EC carriers, their own national carriers can benefit from EC free market provisions and expand through the regular market mechanisms.

827. Current practice already uses the concept of categories, or fields as we call them. Examples are the distinction between passenger and cargo operations, the different IATA categories and descending priority order for scheduled public services and programmed charter services, irregular commercial services, general aviation and military. None of these segmentations is based on nationality. Governments give preference to international carriers and 'discriminate' against their own national carriers, to satisfy legally binding bilateral agreements and to ensure that those national carriers receive favourable treatment abroad on a basis of reciprocity. In the USA the DOT has withdrawn slots from US domestic carriers to provide access to foreign carriers at HDR airports.

828. The field of 'foreign general' is constructed as a temporary category which will reflect the changes of status of carriers during the transitional phases of leaving a bilateral agreement to join the EC field. It may not be an instantaneous process as most legal advisers would recognise. In addition, certain foreign carriers might operate without formal bilateral agreements, while manifesting the desire to join the main EC field. The possibility and means to deliver full reciprocity from those countries may also take some time. Those carriers will temporarily belong to the foreign general field, pending formal incorporation into the EC field. The concept is introduced, but the name of the field might be changed. We believe it is a feature of both the options we have developed that they can be made to work within a legal framework.

829. As revealed by the legal opinion, there is some impediment to the implementation of either option. Work has to be done by the legal authorities, at the national and international levels, on a plan to tackle the discrimination and fair charge issues. There seem to be wide variations of landing charges, and the question of what is appropriate

and fair has been debated within the international community for decades now. We have discussed this problem in Chapter 3.

SUMMARY

830. In summary, the legal opinion is noted. Care must be taken to set up the re-negotiations within a clear framework of objectives. We have designed both options with a view to making the transitions as smooth as possible. We have also constructed them so that they could provide a stepping stone towards a freer market. No one outside the EC will be disadvantaged relative to their position today. Tasks remain, but the interpretation of most of the current rules is so ambiguous as to make the necessary changes achievable in time. We believe the EC has both the power and the right to insist that those who wish to benefit from a more open slot allocation system must give up their rights to special treatment.

9. IMPLEMENTATION STRATEGY

INTRODUCTION

901. Both options developed in Stage Two of the study involve far reaching changes to the system for allocating slots at congested airports. Even the Regulatory option, which escapes the radicalism of money in the Market Hybrid, introduces concepts of sacrifice and fields of operation. These are likely to provoke a strong reaction from those who may be disadvantaged by them.

902. We believe that change is inevitable, but, faced with such difficulties, one strategy we must consider is that of doing nothing, at least for a while. This is examined briefly in this section, before the strategies and timetables are presented for implementing the two options developed here.

THE DO-NOTHING STRATEGY

903. Before considering the implementation of either of the selected options, it is logical to consider the possibility of letting things take their natural course. There is a great deal of activity on the subject of slot allocation within the EC, in individual countries, by IATA and in the US. We understand that IATA are responding to the EC proposals with revised proposals of their own. These may be transmitted through their members to the member States. We also understand that the EC may be revising its proposals as a result of the reaction to its original initiative. These proposals are likely to address the subject of new entrants and the sacrifice of slots. It is not clear, however, whether they will produce proposals which will address the fundamental issues which we believe are driving the slot allocation problem.

904. If the capacity shortage within the EC can be solved by more efficient use of existing facilities and the building of new ones, the monopoly rents will disappear and there is less need for radical change. Changes which prepare the market for the use of money cannot be justified if there is no intention to move to a free market. Moreover, the use of money is inappropriate unless a clear strategy exists for using the surplus collected. The commercial playing field is currently uneven. Political influence and privilege is endemic. Only if the intention is to free the industry of these is it credible to introduce a system which depends on their disappearance. If rents cannot be applied to bilateral operators, there is little point in trying to create a monetary option within the

EC. It is our view, however, that a move towards a freer market is both desirable and inevitable. We have seen nothing which indicates that orderly progress cannot be made, given the political will.

905. Our studies have shown that slot allocation must be dealt with as a whole system, serving policy objectives and containing systematic sub-elements which support each other and which create the minimum internal tension. Even if all the assumptions listed above are endorsed, we consider that it is still necessary to have a consistent set of policy objectives to make the endorsement clear. Once the policy objectives have been endorsed, there is a need for some method of assessing whether a new proposal or a revision to existing arrangements is a temporary fix or a step towards a long term objective. It may even hinder progress, as we consider has happened in the US by the precipitous selling of slots outright.

906. The current activity and the relief of pressure on capacity has given a breathing space. We feel that there is a chance that revisions will be agreed which will meet some of the policy objectives as they are now stated. In our limited exposure to the various administrations we have not been able to detect moves, similar to those made by the Department of Transport in setting up this study, to provide a broad base against which alternatives can be judged. We have not been advised that the policy issues, exemplified by those described in paragraph 904, are being considered. The analysis of the policy objectives we think is unique to this study, and therefore to the UK.

907. We conclude that while there may less need to act quickly, the relief offered should be exploited. The policy functions identified by this study should be rationalised. At the least, a coherent set of policy objectives should be put in place. Also needed are assessment tools to allow the rational judgement of any options which emerge from the current negotiations between the EC and IATA. If the do-nothing strategy is attempted, there is a risk that both the industry and the authorities will be overwhelmed by the effects of unstructered changes and palliatives.

IMPLEMENTING THE REGULATORY OPTION

Introduction

908. The implementation of the Regulatory option does not require drastic steps, as the proposed system is an adaptation of existing procedures. It does contain sacrifice provisions but these are initially limited to the margins of airlines' operations. They are

only extended if it is agreed that sufficient competition has not, in fact, been introduced. The following contains a tentative schedule which could serve as a guide for actual implementation. Considerations about the overall implementation strategy and wider policy implications are discussed.

First Steps

909. *Policy Determination* - One year before the actual implementation date, the policy level of the administration (Department of Transport) must decide and publish the policy priorities regarding the nature, the number and the size of the fields which will comprise the system. These decisions will be based upon an analysis of the present market conditions, and on the latent and future demand in the medium to long term. These will be combined with the policy objectives of introducing or limiting new or existing carriers or types of operations at congested airports. The rules on the qualifying criteria for each field will also be published at this stage. The rules governing the EC field would have to be incorporated in a legal framework. Some minor renegotiation of certain bilateral agreements might be necessary.

910. *Slot Pool Creation* - Five months before, the full timetables of airlines (scheduled) services for the forthcoming season are currently required to be submitted to the Coordinators before each IATA Schedule Coordination Conference. Usually the practical deadline for draft timetables is a number of weeks (say, 3) before the start of the Conference. This schedule can also drive the activities of the independent allocator who is the new feature of this regulatory system. He will know the totality of the airline demand for the following season out of the coordinated airports. He will then apply the confiscation (different from sacrifice) rules. Initially, the only confiscated slots will be those identified from the IATA historical precedence principle (non-use last equivalent season). In the second year, slots will be confiscated under the harsh 'use it or lose it' rules (non-use for 3 times or over a 2 week period, with qualified exceptions).

911. At this stage, the airlines will also have indicated which slots and in what preferred order they would volunteer for sacrifice at the congested airports. An overall 10% allotment is initially required from each airline, proportional to their total slot holdings at the congested airport. Adjustments will be made by the allocator when he compiles the whole list of available slots in the process of constructing clusters for new entrants. An appeals procedure may have to set up to resolve ambiguities which were revealed by the first application of the revised rules.

Re-allocation

912. Once the pool has been established, the allocator will distribute the slots in clusters according to the specific fields' requirements to the qualified carriers. The specific field criteria and conditions are described in Annex C2. The new entrants will be prioritised according to their historical standing in the waiting list, as is current practice under the airport scheduling committee/IATA procedures.

913. All these activities can take place within the existing framework of IATA, airport scheduling committees and coordinators. They actually do already occur to various degrees through the coordinators who perform allocation duties in the present system; the major difference is that now the allocation and coordination functions are separate. Once again an appeals procedure may be needed to smooth the first application of the new rules.

Swapping

914. The schedule matching activity goes on till the beginning of the season, as is now the case. Airlines swap within the fields to adjust and improve the efficiency of their schedules.

Start of the season

915. The start of the new schedule season marks the beginning of short term trading (no money) and day-to-day adjustments of surplus or unused slots (tactical slot management). The monitoring function is also triggered, and the process repeats itself for the next season.

General Observations

916. This system can be implemented any time after the policy makers have so decided, and follow the path described here. It is incremental and gradual in its approach. While, following two years warning, the first year of sacrifice (10%) will cause aggravation and concern to the airline industry, as a whole the changes are not significant in scale. The following two years will see a pause, but the sacrifice pool may then only require a nominal 5% on a recurring basis. The moratorium we suggest after three years of this system should allow the system to stabilise. It will provide ample opportunities for the airlines to reassess their strategies and adjust their commercial behaviour in a slightly

modified market environment. The policy makers can also analyse the impact of their actions on the airline industry and decide on the changes needed in the next round, if the results are not convincing in achieving the stated goals. The advantage of this Regulatory option is that the regulator does not lose control of the slot allocation process. The fields can be re-sized to match policy requirements.

IMPLEMENTING THE MARKET HYBRID

Introduction

917. The Market Hybrid, being a radical departure from the current system, will require a well orchestrated programme to support its implementation. On the administrative side the functions will have to be organised and the various, rules, models and procedures put in place. Equipment to run the auctions and hold the slot and trading databases will have to be bought and developed.

918. More fundamental will be the requirement for a framework of law to be introduced to allow the option to operate satisfactorily. This framework will have to include the aspects of the national systems which impinge upon the EC and the various international agreements which currently control the slot allocation process. One of the difficulties will be extracting the slot allocation process from the current route allocation agreements. Although these are officially separated at present, we have evidence of linkage in many countries at the diplomatic level. One of the tasks of the Agency Policy Function is to formalise these restraints.

919. The industry will also require time to prepare for the use of money. Fortunately the experience in the USA will be relevant here. Airlines will have to set up systems which will allow them to consider a business strategy towards slots in much the same way as they now consider aircraft and facilities purchase. They will have to reorganise their capital and leasing base to take account of the increase in their assets which purchase and trading will produce. Well organised airlines will probably set up slot trading as a profit centre. The increased instability caused by the leasing system will inevitably cause slot allocation to rise in the list of priorities within airlines.

920. Gaining experience in the changed methods of refining schedules will have to be learnt. Changing the current swapping for bidding through a broker will be stressful at the start of the transition phase, but it is a skill that has been easily learned in other markets. The matching of slots and clusters, when schedules have congested airports at

both ends or at several places in the network, will be challenging. We have seen several embryonic computer systems which could be developed into automated real time trading systems. The expertise from the stock exchange and the commodity markets would no doubt contribute to the solution of what is in essence a mechanical process. Further study would be needed before it was clear whether a traded options market in slots would help to clear the after-auction trading market.

Implementation Programme

921. The administration would take much longer to set up its systems than that needed by industry to respond. There would be little point in generating a programme before the political and legal issues were at a point where their solution could be foreseen. Modelling would allow the whole of the EC market to be simulated to judge the type of fields needed at the start of the transition. The nominal size of these fields and the make up of their clusters could be simulated. Mock auctions could be held to refine the systems, and economic models could be developed to simulate the airline behaviour, to help the agency's allocation function to set initial rents and transfer prices.

922. If enough progress could be made by a single or a pair of EC nations to re-negotiate their bilateral agreements, it would be quite possible to construct a prototype of the system at a national level, with national fields taking the place of the steady state EC fields. This could be expanded as more EC nations negotiated new bilateral rights, and themselves became compliant with the requirements of full transparency of policy, and full reciprocity. These are the keys to the success of this option within the EC. The structure of the option is such that its procedures could form the basis for an audit by both EC and national anti-monopoly agencies.

923. We can see no reason why this system should not start one year after the political arrangements have been decided. This would mean that the first auction could take place in year two, and operations could start in the third year.

924. The Market Hybrid has been designed to be implemented in five years, this being a compromise between speed and the need to allow the incumbents time to adapt to the sacrifice provisions. The letting of seven year leases has been designed to allow a rest period between the end of the transition and the calling in of the leases sold in year one. This rest period has been allowed because it is calculated that there will be very active trading in the last two years of a lease, probably from the scheduled carriers to the

charter operators, the former trading back into longer leases and the latter taking advantage of the cheaper short leases which may suit the shifting market.

925. This sequence of implementation strategy of: political, legal, administrative organisation; industrial organisation, preparation, auction, transition, rest; and finally, resale will result in the full Market Hybrid being functioning after ten years, if policy can be kept fairly stable for this period.

THE OPTIONS IN SEQUENCE, AND BEYOND

926. The relatively small encroachment of incumbents' rights proposed for in the Regulatory option might be seen alternatively as an isolated fix, an experiment (as some would claim), or finally as the initial step in an overall and structured plan to carry the airline business into a full market driven option early in the next century. Assuming the Regulatory system succeeds in opening up competition after a period of time, the next step might be for the regulators to inject a money element into a system which has learnt to cope with added competition, albeit imposed by regulatory means. An option such as the Market Hybrid could be an ideal platform from which the 'privatisation of slots' programme could be launched without the authorities losing control of slot allocation as we believe happened in the US.

927. The market could develop, stabilise and mature under such a controlled monetary system. If, as we expect, the.effects on competition are beneficial and correspond to the requirements of all (or most) concerned parties, the final step may be the gradual relaxation of government's interventionism to let the system move into the free market, subject to existing control measures on monopolies and protection of airlines and consumers. We have seen nothing which should inhibit the setting in motion of a coordinated, long term programme to achieve this aim.

10. AIRLINES WORKING THE OPTIONS

TRODUCTION

01. Any new method of slot allocation will affect the airlines more than any other terested group. This chapter presents an airline's view of the steps it must follow as it orks through each of the proposed new slot allocation options.

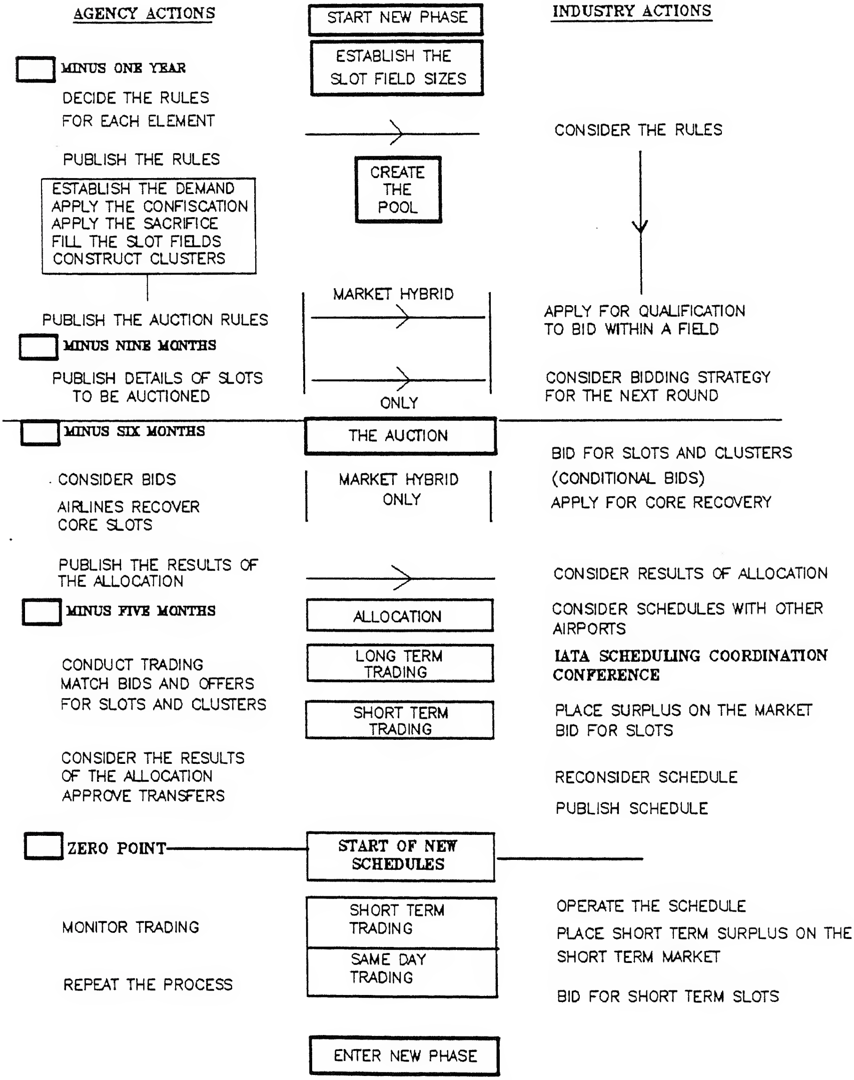
ORKING THE REGULATORY OPTION

02. The operational events as seen by an airline are presented in Figure 6.1, which is peated here for the reader's convenience. Generically, the steps of initial allocation, crifice, trading and re-allocation are similar for both options. The specific provisions the Regulatory option represent only marginal (though significant) changes to the esent airline operations practices in four respects: the sacrifice, the new entrants, the elds and the tightening of slot usage rules.

03. The previous chapter expanded on the implementation strategy of the Regulatory ption, and the following discussion will parallel the stages described there, this time om an airline's perspective. The UK is taken as a typical example. One year before ie actual implementation date, the Department of Transport, with the CAA, will ublish the policy priorities regarding access to the congested airports of London eathrow and Gatwick. Specifically, they will declare the nature, the number and the ze of the fields (10). The rules will include qualifying criteria for each field along the nes of the suggested definitions presented in Annex C2. We assume that the decisions f the Department of Transport/CAA will follow a phase of consultation and lobbying as has been continuously carried out up to now) with the airlines and the user groups bout the revised slot system.

004. The most critical aspect of the Regulatory option concerns the sacrifice rovisions. Having identified the fields which contain its current slot holding, every irline must conduct a detailed profit and risk analysis of all the sectors of its network. It nust then decide in which order it wishes slots to be sacrificed in each applicable field, n overall ten percent of all its slot holdings at the congested airport. While a ten ercent withdrawal might be seen as a relatively small price to pay for the gifting of the randfather rights to the rest of their slots, we anticipate significant resistance to this new mposition, as discused in the next chapter.

FIGURE 6.1 SEQUENCE OF OPERATION OF SLOT ALLOCATION



1005. Airlines will have to decide for which field(s) to register. Most decisions will be determined by the type of network currently run by the airlines. Operators qualified only for bilateral and foreign national fields will have no option, as their services are an instrument of government policy and the legal agreements secured between countries. The nature of those conventions and the resulting 'designated carrier' status, might evolve as new legal grounds are gradually opened towards the total integration of the European common market.

1006. Six months before the start of the new season, the airlines will pass on the sacrifice list to the allocator, once they will have settled and negotiated internally their participation and network adjustments in the relevant fields. The process of qualification will have been completed by that time. The allocator will then re-distribute the slots to the qualified participants in each field during the normal process of the IATA Conference, subject to the same deadlines of submission. The new entrants will have to reconcile their needs with the slots allocated to them by the allocator. The process of schedule adjustment, within the fields, will take place, as now, at the IATA conference and will continue until the start of the season.

1007. New 'use it or lose it' provisions will definitely impose additional pressures on the operators compared with the relatively lax and historical regulations of the present system. Airlines will have to notify slot cancellation and slot usage much more tightly to protect their existing slot allotment.

1008. Most aspects of the operation of today's airport scheduling committees and coordinators are maintained in their present form, but new focal points are created with the independent functions of the allocator and the coordinator. Apart from those defined roles, everything else remains the same.

1009. The appeals structure is essentially the same as today. An additional level is established for the allocation function, but otherwise the interface of airlines with the coordination and scheduling activities is not changed. It is simply made crisper and more focused in some of aspects in which it is currently deficient.

WORKING THE MARKET HYBRID

The Effects of Money and Leases

1010. The Market Hybrid, being a radical departure from the current system, will cause the airlines to make significant changes to the priorities they place on the allocation process, although the processes themselves are essentially the same. In order to qualify to bid within a field, they will have to provide unambiguous evidence as to size (small new entry), relationship with other airlines (independence for quota) and sponsorship (bilateral). Airlines will have to introduce long range slot planning because of the inevitability of the leases lapsing after 7 years. We expect that many airlines will choose to trade out of the end of leases, buying longer leases in exchange. This will remove the risk to their schedules.

1011. The major change will be that airlines will have to conduct a detailed profit and risk analysis, to establish which slots they will offer for sacrifice during the transition, which they will declare as Core. Also, they will have to decide at what price they will bid for new slots, and when they will invoke the Core clause. They will also have to decide the order in which they will list the conditional sealed bids, so that they effectively stop bidding once their requirements are satisfied. They will also have to decide which bids to withdraw if they should succeed in winning more than their permitted percentage of any one field.

Sequence of The Auction Process

1012. The sequence of the auction process is set out in Chapter 6 and illustrated in Figure 6.1. This shows a pattern similar to that seen today except that the airlines will be required to study and understand the agency's published objectives concerning the fields, and the rents which will be charged both for retained slots and for those which are being auctioned in the next round.

1013. Once the sacrifice requirements have been established, the airlines will then study the list of lots of slots and clusters being auctioned. They may try to make better representation to the coordinator to get some of these changed, so as to match better their requirement. The airline now decides if it wishes to offer surplus slots for sale at the main auction. If it does so it decides what reserve price it wishes to set, or it requests the agency to incorporate the slots in clusters in the hope of getting a better price.

1014. The construction of the sealed bids comes next. The judgement of what to bid for and what price to bid is the essence of this option. Airlines will have to get used to this exercise as an essential part of their business.

1015. Once the bids are in, the iterative process of Core recovery begins. The airline will be invited to declare its Core slots. It will then be told the top price which was bid for these. The airline can then decide which to invoke, up to the limit allowed by the rules. These will be awarded as long as its maximum allocation in that field has not been exceeded.

1016. The iterative process will then produce the airline's winning bids, once again limited by maxima in each field. The airline now knows the identity and cost, both capital and rental, of its stock of slots. This is conducted at all the EC airports. The allocation process is now complete.

1017. The airline is now free to enter the long term trading market with the allocator acting as broker. Clusters may be broken up and slots may be sold in groups. The airline buys and sells to construct its schedules.

1018. If long term slots are not available, or if the airline wants to start a schedule before the time (at the start of the next season) when the slot will be transferred for its use, the airline can enter the short term market to try and buy a slot in the correct field, close to the timing of that permanent slot. All these trades have to be approved by the coordinator as conforming to the various ATC and airport constraints. The airline continues to refine its schedule, by trading. Slots which are not used will be confiscated, and special care will have to be taken not to breach both the 'use it or lose it' rules or the limitations on short term and same day leasing.

Appeals

1019. The airline will have access to all levels of the agency to voice opinion on both the overall operation of the system and the detailed rules and procedures. There will also be an appeals process for instances where airlines think that they have been unreasonably disadvantaged. The principle of this procedure is that it should be fast so that schedules can be planned. The agency will have ample funds and is likely to pay out or allocate an equivalent slot rather than attempt to unravel a complicated allocation or trading sequence.

11. THE CRITICAL ISSUES

INTRODUCTION

1101. Stage Two of the Study required that we address a number of issues. A number of other topics have come to light in the course of the construction of the two slot allocation options. The succeeding chapters summarise the whole of the findings of the study, but this chapter highlights the critical issues as revealed to us.

1102. These critical issues are matters of principle or detail which we believe will have to be addressed before any change to the current system can be set in motion. Some are general constraints, while others relate specifically to either the Regulatory or the Market Hybrid option. The chapter takes each critical issue in turn, explains it with references back to the main text, and summarises the actions which we suggest should be taken to progress the subject.

SELF REGULATION OF THE ALLOCATION PROCESS

1103. The current system of slot allocation is claimed by IATA to be self regulated. Certainly the guidelines used by the coordinators are those published by IATA. There is also no official inter-governmental coordination at the allocation conferences. The coordinators represent their airports; they are often independent of airlines and governments.

1104. We have observed that the EC has stepped into the policy area of coordination with suggestions for modified rules, using the sanction of the threat of the withdrawal of block exemption from cartel regulations. The rules are being adhered to by some coordinators.

1105. The level of independence of the coordinators is not uniform. Many are employees of their governments' transport departments. Some operate under fairly specific political direction. Many are seen by airline schedulers as having a duty to protect their national interest in both airports and selected national carriers.

1106. The critical issue is whether modification of the allocation system should rationalise the arrangements towards a genuinely independent operation, or towards a properly constituted international administration.

1107. Our view is that if a monetary option is to be adopted, the organisation will have to have its own legal and political structure. The policy function of the agency should be embedded in the governmental structures. If money is not introduced it would be possible to rationalise towards true independence but it would be difficult to prevent the EC stepping into the policy vacuum if IATA continued to resist procedures which included sacrifice and confiscation. Without the imposition of a framework of international law it is difficult to see how a uniform set of standards could be guaranteed, so that progress could be made towards a freer market in slots at congested airports.

1108. On balance we conclude that the best strategy would be to recognise the logic of the three tiered structure we have identified for the agency in Chapter 4, and confine government involvement to the policy function, leaving as far as possible, the allocation and coordination functions to operate in their current efficient, independent mode.

SACRIFICE AND CONFISCATION

1109. All the options we studied contained elements which were designed to erode the grandfather rights to slots. Both options constructed in Stage Two include much tighter confiscation through 'use it or lose it' rules. Sacrifice in the Regulatory option is by occasional withdrawal of a proportion of slots according to number held. The Market Hybrid forces the progressive surrender of slots into the auction process.

1110. The concept of sacrifice and confiscation is fiercely opposed by most of the individuals, companies and organisations with which we have had contact, particularly in areas which they see affecting their business. It is clear to us that any option which includes these measures will have to be imposed. If the assumption is that change must come by consensus, no radical change to the current system will be practical.

THE NEW ENTRANT PROBLEM

1111. The purpose of the creation of a pool of slots is to allow an allocation to operators currently excluded, on the expectation that introducing competition will benefit the user.

1112. Our analysis shows that the critical decision involves the level at which intervention should be imposed on the system. Proposals which involve the detailed rearrangement of routes or even individual flights are highly administrative. They produce tensions in allocation systems which in all other respects are aimed at being more liberal than the current system.

1113. In both our options we have provided protection for new entrants, only small new entrants in the Market Hybrid, but we have left the choice of which routes on which to use these new slots to the successful candidates. It is important to recognise the style of any particular allocation option before introducing a critical element. The treatment of new entrants must be consistent with the rest of the workings of the option.

MODELLING OF THE REAL DEMAND

1114. We recognise that the modelling of demand is an inexact science. Modelling was excluded from Stage Two of this study. Nevertheless it is our view that progress cannot be made on a coherent strategy towards the implementation of any new option unless a number of modelling exercises are attempted.

1115. For the options constructed we have provided estimates of the sizes of the fields, the type of clusters, the effect of sacrifice, the effect on costs and the effect on traffic patterns. All these are based on very wide assumptions and have not been checked with either the industry or the official models held by the CAA. The price elasticity of the various fields is critical to the analysis of fares in the Market Hybrid.

1116. Models to provide these estimates will be required by the agency if these, or any variation of these options, are introduced. They will be needed before the implementation begins, to help decide the size of sacrifice and the rent levels, for instance. They will also be needed to check that the elements of the option are producing the desired effect. We consider it essential that the modelling exercise is conducted in later stages of development of any option. In the UK, the CAA has a sophisticated array of passenger demand forecast, passenger allocation models, a London Route Allocation Modelling Exercise (LARAME) tool. All or some of those methods could be used for the purpose of analysing the specific impact of a monetary slot system. The intermodal implications of rising air fares are also to be addressed in the overall transport sector.

USE OF MONEY AS A MARKET MECHANISM

1117. As we have explained in Chapter 7, although the auction process will merely expose some of the monopoly rents which congestion is generating in today's system, the introduction of money will have a radical effect on all aspects of both the industry and the administration. While the step to the Market Hybrid is logical if progress towards a freer market is the aim, the risk of disruption has to be considered.

1118. We have attempted to construct a coherent, logical option. We have explained the reason for each element. This explanation should serve the purpose of illustrating the sensitivity of money in this type of option, positioned as it is to allow the administration to retain control of the implementation of policy objectives. Internal tensions are inevitable. This makes it critical that the details of the option should be worked out against an overall strategy. Modifications can then be made logically rather than in response to crises.

1119. The use of money is resisted by most of the potential participants. The argument is that it will put up costs and therefore fares. There is also a view, that someone else will be able to, unfairly, pay more and drive them out of business. There is some evidence of the covert use of money. Recent takeover bids and the transfer of the Heathrow rights to US carriers are examples of valuations being put on slots. We point out in Chapter 7 the radical effect that money trading will have on the capital structure of the industry.

1120. The overt use of money is a step change decision. It is critical that this is spelled out as such before the next move is made to develop the Market Hybrid option. Only then will it be possible to break down the coordinated reluctance we found on the part of industry to discuss the option. Sensible comments on the details of the option, from those who will have to operate the system, are critical to its further successful development.

THE OUTFLOW OF FUNDS

1121. This stage of the Study was required to assume that the proceeds from the auctioning of leases and rents would be taxed away to the exchequers of the relevant nations.

1122. We point out that this amounts to governments acting as classic monopolists, exploiting a shortage they have created. In a free market these funds would attract capital investment to increase the supply and thus lower the rents. The taxation assumption results in great internal tension in the system and is the cause of much of the hostility of many of the individuals with whom we have had contact.

1123. The closer to the point of extraction the money extracted is fed back into the system, the lower is the tension. A handout to each passenger might be an extreme example of this process.

1124. The construction of further elements of the Market Hybrid option will be critically dependent on this feed back loop for the flow of funds. The importance of defining the proceeds' route, and the radical effect on every other element in the option if it should be changed, must be recognised.

THE BILATERAL PROBLEM

1125. It was a fundamental requirement for the development of the two options that they should be able to operate in a mixed EC/non-EC environment. We have addressed this problem by using a Bilateral field - the Regulatory option also uses a Foreign General field. We confine to these fields all those who avoid the sacrifice and auction process by invoking a bilateral or international agreement. If national governments grant EC carriers full reciprocity and prove that their airlines operate in an appropriate commercial regime, they may join the main EC fields.

1126. Bilateral traffic makes up some 25% of the traffic at congested airports. The renegotiation of the many hundreds of bilateral agreements is critical to the move towards a freer market. The Regulatory option presents some problems in that it proposes to confine bilaterals to the strict limits of the agreements. Legal advice is that this may cause retaliatory action. It is our view that the power of the EC will be needed to persuade non EC governments to accept this designation. They could only join the EC fields if their own system was audited as fair by the EC.

1127. The Market Hybrid option has put in place the mechanisms to ensure that bilaterals are charged exactly the same rent as the total imputed costs to EC operators of equivalent slots. Legal advice in Chapter 8 is that this will still cause friction in the international community. As with other critical issues, we see little alternative to tackling the issue head on. We are proposing a radical change to the current system and the agreements which were negotiated decades ago, to serve a different scenario, will have to be renegotiated. We have detected that, informally, several foreign operators would be interested in giving up their bilateral and joining the EC fields. This transfer could be conducted on a national level, taking each agreement in turn. We feel a much more fruitful route would be to attempt to conduct a block negotiation on behalf of the EC. This would allow the necessary power to be brought to bear on the bilateral nations.

1128. We agree that the bilateral situation is sensitive. We feel, however, that once the will of the EC is made clear and the size of the task is recognised, a properly resourced project could produce agreements which would make the bilateral fields acceptable. If it is decided to pursue the route towards fundamental change, further stages of development should set up a project group to plan this critical task.

THE LEVEL PLAYING FIELD

1129. The most consistent complaint made to us about the current system and alternative proposals was that they were not fair. Some of this was special pleading. While we found that some of the major elements seem open and efficient, our studies cause us to agree with the statement that much of the air transport industry is a random collection of cartels, patronage, vested privilege and raw enterprise.

1130. We support the argument that any revised system has to allow for a wide variation of quality in its implementation. Slot allocation can certainly act as an encouragement but it cannot be used to solve all the administrative problems of the international industry. The two options both make allowances for this variation. We suggest that a prerequisite to invoking change is a trusted auditing system, which could satisfy all participants that everyone was playing by the rules. This could also be the forum for appeals against unfair practice by individual agencies. It is absolutely critical that no attempt is made to impose change in a way which will risk destroying the open parts of the system, by allowing the privileged operators to exploit their political or economic protection.

POLICY OBJECTIVES

1131. Stage One of the study included a limited exercise to capture the policy objectives of a range of official bodies. The result of this exercise were used to assess the merits of the two options constructed.

1132. Two most important criteria for a slot option are that it should work and that it should allow policy to be implemented. The definition and endorsement of a set of policy objectives is thus critical to the construction and operation of a slot allocation system. The exercise is difficult because objectives often conflict. The wish for traffic balance, competition, low fares and the full use of the airport facilities, is difficult to realise in practice. The policy capture allows the compromises to be exposed and endorsed. This stops the implementation swinging around as different views gain sway.

1133. This is particularly important in the case of the Market Hybrid, where radical changes are being made which may take a decade to achieve. We believe that the method of policy capture developed for this study should be further refined. The capture should be completed so that any critical shifts of policy can be easily detected. As each feature of the system can be identified with its related policy objective, all the necessary changes to the system can be initiated quickly, so that the changed objectives are achieved without the effects of the changes randomly destabilising critical elements of the system.

THE CONSTRUCTION OF SLOT ALLOCATION

1134. The theme that we have continually returned to during this study is that the construction of slot allocation systems is a strictly practical operation. It must however be subject to the discipline of policy objectives, the need to operate as a stable, responsive system, and desirability of having the minimum practical internal tension.

1135. Our studies have convinced us that ad hoc changes are unlikely to achieve their objectives or even improve the situation. Any system can be subjected to our practical analysis. Using these tools it is possible to construct a system to satisfy most conditions. It is of critical importance that any further development of the selected options should keep track of the basic logic of the construction processes to date.

12. THE WAY AHEAD

THE CURRENT SITUATION

1201. Stage One of the study identified the assessment method and identified a range of slot allocation methods suitable for further development. The Regulatory and the Market Hybrid were chosen by the Department of Transport. Stage Two has developed these in some detail and answered a number of questions of principle in so doing.

1202. There has been considerable activity in this period. TDRs have been relaxed in the UK, there has been a overt valuation of slots during the transfer of rights between US airlines, and the EC modifications to the IATA allocation rules have been implemented by certain coordinators. IATA has also drafted responses to the EC initiatives.

1203. The current downturn in air traffic has relieved stress on many airports. The indications are that the airlines have managed to satisfy most of their requirements for the 1991 winter season.

THE DANGERS OF PAUSING

1204. There seems at first sight to be a good case for pausing to see what effect these measures will have. The deterioration in the state of the industry's finances has certainly made airlines even more resistant to change, particularly towards something as radical as the Market Hybrid option.

1205. There are dangers in this approach. The changes have done little to increase the capacity of congested airports, the cause of the problem, and experience indicates that after a pause of this type, the traffic increases to its previous level and then continues at a normal rate of expansion. Increasing congestion is inevitable.

1206. It seems to us that the move towards both a more logical and freer method of slot allocation is desirable and inevitable. But time is not on our side. Both the options will take a considerable time to prepare for, the Market Hybrid up to a decade to implement fully. We suggest that the preliminary negotiations and further development of the options should continue in parallel with observation of the results of the small changes to the current system.

THE NEED FOR CONSULTATION

1207. The circulation of a summary of our Stage One report produced a limited response from industry. Our Stage Two timescale has only allowed a limited time to interview this group. Response was inhibited by the lack of detail. There has been a reasonable reluctance to endorse or comment constructively without this detail.

1208. This Stage Two report provides detail to great depth in a number of key areas, and although obviously not complete in every aspect of both options, should provide a sound basis for a full dialogue with all interested parties. We suggest that this consultation should include a wide range of UK officials including the CAA, EC and foreign airlines and airports, as well as the national and Community government officials. The official response of IATA would be essential to allow further plans to be formulated. This consultation will have to be conducted fairly forcefully if it is not to become protracted and an excuse for delay.

GENERAL PROGRESSION

1209. When either option or any variation is chosen for further development there are a number of activities which should be set in hand. The assessment method developed in Stage One should be refined so that it can be used to assess the systems as they are developed. A fully developed method of this type is needed to permit the rational assessment of options and changes proposed by other agencies and organisations. This could be a valuable tool in the drive to improve the quality of the options and measures being suggested.

1210. This study has not developed new, or used any of the existing, modelling tools. The next phase must include: the modelling of the effect of the sacrifice rules; the refinement of the fields; projecting the field distributions (Figure 5.1) 15 years hence; detailing the mechanics of clustering within these fields; and refining the traffic demand, particularly between congested hubs.

PROGRESSING THE REGULATORY OPTION

1211. The critical features of the Regulatory option include all the above items. Particular emphasis should be made on studies of the harsh ‘use it or lose it’ rules, and the size and regularity of the sacrifice element if this is to achieve the policy objectives.

PROGRESSING THE MARKET HYBRID OPTION

1212. The radical nature of the Market Hybrid means that a coherent programme of development and implementation should be set out as soon as it is agreed to progress its development further. Naturally this plan need only be endorsed in stages.

1213. The wide range of critical issues means that a number of sub-elements will have to be addressed at the next stage. These are: the legal and bilateral issues, including the size of the task and who should best negotiate; the traffic predictions and the detailed definition of the fields needed to cope with and adjust the balance in accordance with the policy objectives; the workings of the auction and the trading systems and the resources needed to set up and run these; and finally, the financial modelling of both the banks and the airlines, together with the traffic models, needed to establish the likely flow of money and the effect on efficiency and thus passenger fares.

PARALLEL DEVELOPMENT OF THE OPTIONS

1214. If a choice cannot be made between the two, it would be prudent to conduct parallel development. The Market Hybrid is certainly a suitable staging post towards a full free market option. This might be appropriate when most of the current unevenness has been eliminated from at least the EC operations. The Regulatory option would itself provide experience in constructing fields and would allow observation of the actual effect of disturbing the current grandfather rights by sacrifice and fierce 'use it or lose it' rules. It would be fruitful to develop both options together so that the step from one to the other could be made logical.

1215. Although both options own the same principles, they will diverge as they are developed in more and more detail. If parallel development is undertaken, two teams will probably be needed. They would have to work together to avoid confusion in the user community, but they should not be inhibited by developments in each other's option.

SUMMARY OF FURTHER DEVELOPMENT

1216. We consider that a viable programme to develop a freer market in slots could be developed using the tools and outline of the options which have been constructed in the course of this study. Further progress will depend on the endorsement of the principle of changing the slot allocation system. It will also depend on a recognition that this endorsement will involve attacking the critical issues laid out in Chapter 11. Once official endorsement has been obtained, we believe the very knowledgeable community who will have to operate the changed system will come forward with suggestions to make the options work. We have gained greatly from their limited participation to date, and we have no doubt that we have hardly tapped their expertise. A firm potential initiative will allow the programme towards change to proceed.

13. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The Changing Purpose of Slot Allocation

1301. Historically, the allocation of airport runway slots to airline and other users has been administered by the users themselves. As congestion at some major airports has increased, governments have taken an interest in the possible anti-competitive aspects of the present system. IATA has responded to this interest, for example, by modifying its guidelines to provide for new entrants. But, because it can only act with the support of its member airlines, this has limited the scope of its response. However, most IATA airlines do not accept that as congestion increases, some means need to be found to control the build up of monopoly power based on the scarcity of airport capacity. We have found clear evidence that congestion is reducing the turnover of slots at congested airports. Although the current system has coped well, it will face increasing pressure as congestion increases.

1302. Political, economic and physical factors may restrain the necessary increase in capacity in response to an increasing demand for runway slots. Nevertheless, supply needs to be matched with demand as far as possible while meeting the stated objectives of government policy. This moves slot allocation at congested airports away from relatively simple operational issues.

A Systems Approach to Slot Allocation

1303. We have been surprised during this study at the lack of a formal analysis of the overall effect of changing any one aspect of slot allocation. Our systems approach avoids this. We are convinced that ad hoc changes are unlikely to achieve their objectives or even improve the situation. One has to decide the strategy and then design the individual features to fit in with this. Our approach also provides an insight into the functions required of a slot allocation system, and the means to improve the existing system by removing many of its internal inconsistencies while retaining its best features. Our experience is that individual elements of a management system that do not accord with its overall philosophy will bring it down. This applies as much to slot allocation as to other systems. Similarly, our understanding of system dynamics has enabled us to design options that we believe will be robust and stable in the face of changing circumstances.

Separation of Functions

1304. We consider that any system of slot allocation must be administered so that the boundaries of responsibilities are clear and the procedures used are transparent to all. This has led us to propose a three tier structure based on the functions of policy, allocation and coordination. This does not mean that we envisage a vast new bureaucracy: we see the allocation and coordination functions remaining much as they are today and being carried out by the current airport coordinators using their professional skills. The case for a fully independent coordinator is convincing in our view.

1305. We feel though that the policy function should be embedded in government so that government involvement can be confined to the high level inputs necessary to achieve policy objectives. The clear separation of functions will avoid the need by governments to intervene in slot allocation at the route level, as is being proposed by the EC. Where possible government involvement should be limited to giving airlines the right to enter the arena. The right to privileged access to any particular part of the market should only be granted if the whole option is constructed as being highly regulatory. At the moment, the growing differences between IATA and the EC is creating a political vacuum. We observe that the EC has also stepped into the area of allocation with suggestions for modified rules, using the threat of withdrawal of a block exemption from cartel regulations. It is not clear, however, whether the EC will produce proposals that address the fundamental issues which we believe underlie the policy objectives of slot allocation.

The Sacrifice of Slots

1306. A pool of slots can become available for new or different users in one of three ways: voluntary relinquishement, confiscation under a set of 'use it or lose it' rules and by enforced sacrifice. Sacrifice provisions are controversial. They are opposed by IATA airlines who believe they depend on their grandfather rights for economic survival. It is clear to us that any option which includes the sacrifice of slots will have to be introduced by regulation. No radical change to the current system will be practical if it is considered that change must come by consensus.

1307. The shortage of supply has however, to be faced. Increasing congestion and the low turnover of slots at congested airports strongly suggest that some means of allocating slots that are not based on grandfather rights will become necessary if competition is to be encouraged. Governments want competition assuming this as a route to greater efficiency and user choice. The EC's concern at the lack of competition at certain airports has already caused it to intervene by proposing a code of conduct for slot allocation that allows a Member State to withdraw an incumbent's grandfather rights if this is necessary to create new opportunities. Our study has shown that incumbent airlines are correct to fear the commercial consequences of this proposal because of the potential fragmentation of their present market position, while the offer of opportunities to new players will not guarantee improved efficiency or user benefits.

1308. Despite the force of these arguments against sacrifice, we believe it will be necessary at congested airports if the system is to achieve the policy objects set for improved competition and efficiency. Sacrifice is however, only one element and our studies have shown that slot allocation must be dealt with as a whole system. It cannot therefore be considered in isolation from the other elements. As with other elements, enforced sacrifice provisions need to operate to a set of clear rules and cannot be tinkered with indiscriminately without putting them through a full analysis.

New Entrants

1309. The purpose of the creation of a pool of slots is to allow an allocation to operators currently excluded, on the expectation that introducing competition will benefit the user. Our analysis shows that the critical decision involves the level at which intervention to allow new entrants should be imposed on the system. The definition of new entrants is one of the most controversial topics in any discussion about slot allocation and lies at the heart of all the proposed changes. We feel that liberal and continuous application of new entrant rules may fracture the industry. Although they disturb the status quo, they do not seem to guarantee increased efficiency or a greater choice and lower fares. The continuous protection of new entrants will inevitably lead to the need to protect incumbents. This in turn will move the system away from the freer market.

CONCLUSIONS ON SELECTED OPTIONS

Introduction

1310. The Regulatory and Market Hybrid options chosen by the Department of Transport for further development in Stage Two of the study have been constructed, and their operation has been worked out in considerable detail. They are set out in Chapter 6 and in Annex A for the Regulatory option and Annex B for the Market Hybrid option.

The Regulatory option is a modification of the current system but with stricter sacrifice and confiscation rules designed to provide opportunities for new entrants. The Market Hybrid uses money to value slots. These are gathered in fields and clusters and sold at seven year leases to the highest qualified bidder. Some protection is provided to allow incumbents to recover sacrificed slots. The agency acts as the trading broker. There is protection against the build up of monopoly.

Achievement of the Policy Objectives

1311. We have ensured that both options achieve the policy objectives of the administration. They will further the reasonable interests of air transport users, subject to the resolution of certain critical issues identified below. They both address the sacrifice questions and they both give appropriate special opportunities to new entrants. Increased airline competition will result from the measures proposed to reduce the rigidities of the present system while giving a degree of protection to certain categories of carriers.

Practicality of the Solutions

1312. Both options use the concept of fields to differentiate the market to allow operation in an EC/non-EC market. They have been constructed using the tools we developed in Stage One. All their elements have been subjected to assessment for self consistency, low internal tension, and their contribution to the performance of the options as practical systems. Stability, predictability and responsiveness to changes in market conditions were the driving design aims. Subject to the resolutions of certain crucial issues identified below, we believe that both options can be made to work in accordance with stated policy objectives.

The Slot Fields

1313. The construction of slot fields has been specially addressed in Chapter 5. This is an original concept and has been developed to allow the policy objectives to be met. The policy controlling the desired size of the fields, as part of a long term strategy to moderate the market, is a critical issue.

The Role of the Agency

1314. The agency has been rationalised into a three tier structure of policy, allocation and coordination functions. The details are set out in Chapter 6. Obviously the agency functions are much simpler in the Regulatory option because its powers are more focused. We believe the policy level should be embedded in government, so that diplomatic and legal pressure can be brought to bear on the bilateral issues and in attempting to level the commercial level playing field. We observe the EC stepping into the current political vacuum.

1315. The allocation and coordination functions of the agency we see as remaining much as they are today, with the first allocating slots according to a set of rules, and the latter aiding the airlines in the construction of viable schedules. Extra responsibilities will result from the need to construct clusters of slots and fields, as described in Chapters 4 and 5 respectively.

1316. The Market Hybrid uses the same three tiered agency structure but each tier has a number of extra responsibilities associated with the auction process and the use of money in trading. These are described in Chapter 6 and Annex B. We believe that all these functions are well within the capabilities of the skilled operators of the current system.

Sacrifice and Confiscation

1317. Sacrifice and confiscation are both contentious issues. Our studies show that different mechanisms are appropriate for each option. The Regulatory option uses occasional proportional sacrifice, backed up by harsh ‘use it or lose it’ rules. After the initial sacrifice, which is intended to skim the marginal holdings of airlines, the enforced provisions will only be applied if insufficient slots are given up voluntarily or through confiscation. This will protect efficient operators at their hubs. The Market Hybrid uses progressive sacrifice to the auction, softened by an ability of the loser to recover a proportion of Core slots. This option can use relaxed confiscation because it has money as a self imposed sanction for non-use. We conclude that these measures will have to be imposed if any significant pool of slots is to be made available to new entrants.

New Entrants

1318. In both our options we have provided protection for new entrants for a limited period but we have left the choice of which routes on which to use these new slots to the successful candidates. The treatment of new entrants must be consistent with the rest of the workings of the option.

1319. In the Regulatory option, the only advantage to the new entrant is a period when he is free from sacrifice and an extended period before the slot is confiscated for non-use. In the Market Hybrid option, the only advantage the new entrant has is a reduced cost of entry and a temporary relief from the full rents and sacrifice.

Rules for the Various Processes

1320. Typical rules have been developed for the allocation, trading, sacrifice and confiscation processes. They are described in the relevant annexes, together with an explanation as to how they fit into the logic of the operation of the particular allocation system. We conclude that the options will work if rules of this type were applied.

Details of the Rules

1321. The report provides a great deal of detail concerning many of the rules which would be used within the options. These have been made straightforward. Their number is not an indication that the options are complicated to operate; the current system has hundreds of published or implied rules. The explanations are included to make the details and the logic behind the options understandable. We think enough detail has been included for interested parties to enter into informed dialogue concerning the merits of the principles and the operation of the two options.

1322. The rules regarding trading within fields are also laid out in considerable detail, as there will be commercial interest in exploiting the different rent levels in the different fields. We conclude that simple rules can be formulated to made trading useful and straightforward.

The Single Till

1323. A further critical issue concerning money is the international agreements that state that charges should not only be fair but should also reflect the cost of providing the service. We suggest that if airports companies are split, so that concessions rents do not subsidise landing fees, the resulting Runway plc would be able to operate a costed landing fee structure very close to that which is likely to emerge from the Market Hybrid option. This would make the transition easier.

The Overall Need for Modelling

1324. No modelling was provided for in this Study. Without some modelling, we cannot be certain about all the effects of the options. We consider that this must be the next step in the development process. We detail below the modelling which should be carried out.

Limited Exposure of the Options

1325. Resourcing in Stage Two has restricted both the number of organisations from whom we gathered data during the construction process and the number who have been exposed to the details of the options. We consider that a full exposure of the details of the two options to a wide range of interested parties at the national, EC and international level will reveal elements which need further refinement. The gathering of opinion should be conducted in a structured way so that modifications are incorporated systematically. In this way the options will remain robust.

The Impact of the Use of Money

1326. The operation of the auction is given detailed attention in Chapter 6 and Annex B. The overt valuation of an airline's allocation of leases will affect its capital structure according to its current image with the financial institutions. We have evidence that weaker airlines will be able to use the assignment of leases for slots as security, as they do with their aircraft today.

The Need to Model the Financial Impact

1327. The work in Stage Two excluded all modelling, but we have provided rough estimates of the sort of monies which might be extracted at Heathrow, as a typical congested airport. We have also indicated the logical process which would be followed to judge the impact of this on airlines operating within typical fields. We show the effect on fares. This may be 5 to 10% for long haul, but could be considerably higher in the short haul market if it is not moderated by the imposition of fields to restrict competition from prosperous long haul operations.

Money Used in Bilateral Operations

1328. The use of a bilateral field allows operators, who invoke international agreements to avoid the sacrifice and auction procedures, to be charged the same as EC operators. A levy equal to the imputed cost of the lease is added to the rent.

The Flow of Funds

1329. We have been required to assume for the Market Hybrid Option that the money will be taxed away to the exchequer. This causes internal tension in the option and has been the source of opposition from the few organisations we have discussed the options with. It has little commercial logic in that monopoly rents in a free market should attract direct investment to increase supply, thus reducing the rents. We have identified this as a critical policy issue. The tension could be relieved if some way could be found of feeding the money back into the industry at a point close to its extraction.

TRANSITIONAL ARRANGEMENTS

1330. Transitional arrangements for the introduction of the two options are detailed in Chapter 9. These show that, once the critical issues of sacrifice and confiscation are tackled, the move to the Regulatory option is fairly straightforward. The role of the agency has to be formalised and the coordination between congested airports has to be systemised, but the option will not greatly affect the efficient work practices of the current system. We consider that the move to the Regulatory option may be a first step towards the freer market, as exemplified by the Market Hybrid. Further development should take note of this possibility.

1331. The Market Hybrid, using money and the auctioning of leases, is a much more radical change from the current system. We consider that about 10 years will be needed to achieve the full transition. Three years will be needed to negotiate the critical legal aspects, set up the agency and develop all its procedures.

1332. We suggest that the industry could not withstand having more than 20% of the slots sacrificed to the auction process each year, implying 5 years for this process to be complete. This would accord well with our view that the letting of 7 year leases would be satisfactory for the industry. It would allow the authorities the appropriate measure of control over any undesirable long term effects of the use and abuse of money in the slot allocation process.

1333. We think that the Market Hybrid is well suited to movements of policy towards either the more regulatory or freer market regime, but such changes would require a coherent modification to the transitional phase. We think this option allows for such logical modification.

SUMMARY OF THE CRITICAL ISSUES

1334. This study has not revealed any factors which would cause a coherent, determined strategy aimed at achieving a fairly free market in slots within the EC to fail. The critical issues highlighted by the Terms of Reference and exposed by this study are detailed in Chapter 12. These have to be tackled before progress can be made in developing these or any other options.

Self Regulation

1335. It has to be decided if a self regulatory system is to be retained for slot allocation. If it is, the position of the policy function has to be defined unambiguously. The role of the EC in filling the political vacuum has to be recognised and accommodated.

The Legal Issues

1336. The constraints caused by the current legal framework of international agreements have to be recognised and negotiated away. The invention of the bilateral field supplies a framework but detailed negotiations will have to be conducted to redefine the relationships. Our researches show that the EC may have sufficient power to do this. It may be the appropriate body to define the rules for those who do not grant full reciprocity and provide a level commercial playing field.

The Use of Money

1337. The use of money will fundamentally change the slot allocation system. The decision to do so must be made firmly. Only in this way will constructive criticism of proposed options which use money be forthcoming from the industry. The best suggestions come by refining all those generated by enlightened self interest.

1338. The use of the single till in determining airport charges may be a major impediment to the introduction of any monetary option. Radical steps may have to be taken to overcome this. The taxing away of the proceeds of sales and rents is unlikely to be acceptable to many participants in the allocation process.

RECOMMENDATIONS

1339. The current downturn in activity in the air transport industry has provided temporary relief from slot congestion, but it will return. The changes being proposed by the EC and IATA may also provide relief. There is evidence that the pressures building up over allocation can only be relieved in the long term by a more balanced strategy towards limiting demand. It is likely that some regulation will always be needed, but we have found nothing which indicates that a long term strategy aimed at a fairly free market would not succeed. Both the Regulatory and the Market Hybrid offer a coherent alternative and a route to a freer market. We recommend that one or both should be developed further, both in their own right and as stepping stones towards a freer market.

The Choice of Options for Further Development

1340. The decision as to which options to develop should follow a period of wide, structured consultation. If it is decided that a monetary option is required, the Market Hybrid is a strong candidate, as it could be adapted to a range of policy objectives and has a smooth transition phase, which could be modified in the light of experience. The Regulatory option would be a candidate in its own right if a monetary option was not acceptable. In addition, it may also enable the field, cluster and sacrifice rules which will be needed by the Market Hybrid, to be developed. We recommend that consideration be given to the further development of both options.

1341. The lack of modelling will inhibit further development. We recommend that work should be put in hand to model the market, to establish the effect of various policies concerning fields and clusters, sacrifice and confiscation, to estimate the likely natural development of slot prices and rents, and to gauge the financial implications to the industry and its various elements.

1342. We recommend that if the Market Hybrid is chosen for further development, a fully integrated project should be commissioned to address the development of a suitable legal structure, the negotiation of bilateral agreements, the setting up of the agency, the development of its rules and procedures, and the development of suitable tools and models to facilitate the definition and control of fields, clusters and the auction process.

1343. We recommend that the further development of these options and the assessment of alternatives should be based on the logical concepts developed during this study. The assessment methods should be developed further so that they can be incorporated into the models which will be needed to validate the effects of various proposals. They will also be needed by any agency asked to achieve any particular effects by its intervention into the market for slots.

1344. Both these options would have a major impact on the competitive structure of the airline industry. Potential losers from any change are bound to lobby hard to retain the status quo. We recommend that all suggestions for changing the slot allocation systems should be considered against an overall strategy based on fully endorsed policy objectives.

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GLOSSARY

The air transport industry is complex and mature, and it has a wide range of interfaces with engineering, management, financial and government systems. As a result it has developed a large vocabulary of terms of its own, as well as adopting and adapting terms from other areas.

For the purpose of this study it has been necessary to adopt a number of terms which have a unique meaning. This has been necessary to ensure that there can be no confusion at the descriptions of the proposed slot allocation system, or their operation and analysis of their functions.

A number of commonly used terms have also been precisely defined to explain their use in the context of this study.

Agency	The organisation which is responsible for the overall running of a slot allocation system and which carries out the policy, allocation and coordination functions.
Allocation	The mechanism by which slots are given to various organisations.
Allocation Element	The result of dividing up the allocation process into Initial Allocation, Post Allocation Trading, Sacrifice (Initial and Recurring) and Re-Allocation.
Field	A segment of market created by a grouping of slots within which a specific set of rules operate. Fields are created by the application of Ring Fencing.
Policy Objectives	The stated and implied objectives of a government, concerning all aspect of the environment affected by the application of a particular slot allocation system.
Ring Fencing	The act of separating the whole population into a number of sub-elements. The definition of these sub-elements can include any characteristic of the slot, its operator, or its use.

Sacrifice	The mechanism by which the organisations having the right to use slots are required to give them up against their will.
Slot	Time when a take-off or landing may be planned from a particular airport or runway. It is associated with the use of airport and air traffic control facilities.
System Dynamics	The operation of a slot allocation system viewed as a pure mechanism operating on the commercial and official parties involved in the process.
Tension	The effect of various elements within a slot allocation system working under different administrative styles and to a different set of competitive ground rules. Used as a measure of internal stress.
Trading	The process by which the slot rights are passed from one party to another. This may involve permanent transfer or a temporary sublease.

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ANNEX A

DETAILED DESCRIPTION OF THE REGULATORY OPTION

DETAILED DESCRIPTION OF THE REGULATORY OPTIONS

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DETAILED DESCRIPTION OF THE REGULATORY OPTION

A.1 INTRODUCTION

This Annex sets out the detail of the Regulatory option, described in general terms in Chapter 6. It presents the administration functions which would be needed to run it, the mechanisms of slot allocation, of sacrifice and re-allocation, and the regulatory background for those mechanisms. A diagram of the option is at Figure 6.2, which, for completeness, is included with all the figures from the main report at the back of this Annex.

A.1.1 Outline of the Regulatory Option Studied

The Regulatory option is developed with the objective of producing a slot allocation system which is regulatory in nature, capitalising a much as possible on the qualities and operational smoothness of the existing airport scheduling organisation and the IATA working framework. It addresses the key criticism levelled at the current system, ie a lack of fair opportunity for access to outsiders. This option was one of the two options chosen by the Department of Transport for further study, out of a choice of 4 option types which emerged from Stage One of this study.

Overall, this option is characterised by granting of full grandfather rights with limited sacrifice provisions. Slots are given away and then can be freely traded within categories. This is a non-pricing system. It will be protected by a set of internal rules that will act in a manner similar to the TDRs. This will put back into the system some control so that the government can implement some of its key policy objectives, for example, providing access to new entrants at the congested airports and maintaining the required traffic balance.

The initial pool for new entrants is created by a proportional sacrifice of 10%, with the government, through the means of an agency, giving priority to the creation of viable clusters of slots for new entrants.

Recurring sacrifice is limited to 5% for the next two years, after which a moratorium is established to assess reactions on the market place.

A.2 LAYOUT OF THIS ANNEX

We have attempted to make this annex a relatively free standing document in describing the Regulatory option. It describes the general principles which have governed the construction of the option.

The role of the agency, with its policy, allocation and coordination functions is described. The concepts of fields, clusters and slots, detailed in Chapter 5 as they apply to this particular regulatory option, are expanded.

The option is then described in detail; the sequence of allocation, trading, sacrifice and re-allocation are taken in order. Each element is taken down to as much detail as has been developed in the time allocated to this phase of the study.

At each point an attempt has been made to highlight the key features of each sub-element, describing their contribution to the overall strategy of enabling the policy objectives and the operation of a practicable system. The way in which each element contributes to a coherent whole, to produce a system with low internal tension between the elements, is also highlighted. Some of the text is necessarily repetitive, to make each sub-section free standing. Finally, the option is reviewed to highlight its main merits. These are discussed further in Chapter 7 of the main report.

A.3 THE CONCEPT OF THE FIELD

A.3.1 Introduction

In this option the whole set of slots available at an airport over any given period would be divided into discrete fields of slots. These fields would reflect certain categories of operations, operators and routes, which were the subject of the authorities' policies. Each field has three elements in its make-up: who is granted slots within the field, what slots are contained within the field, and what rules apply to the operators of these slots.

The rules would be made as simple as possible, consistent with the efficient operation of the system.

The nature and number of fields have been covered in general terms in Chapter 5. The use of fields in the Regulatory option is a prime tool for the government, if it wants to influence the market place according to stated policies and redress some of the perceived weaknesses and deficiencies of the present slot system.

Given a free rein, the policy makers would foster competition for a defined group of carriers. A regulatory option based on the gifting (at no charge) of privileges to incumbents with limited sacrifice would, in principle, allow the donors to be selective.

As explained earlier, the greater the number of fields, the greater the control, but the farther away is the free market operation of supply and demand when resources are constrained.

We suggest that ring fencing is an administrative step which disturbs the free functioning of the market place. On the other hand, there is no alternative if policies have to be implemented amidst a scarcity of slots.

A.3.2 The Process of Selecting the Fields

The listing of all parties to be privileged and given special protection or access to congested airports is a very controversial step. The number of the potential candidates presented in Annex C2 is an indication of the difficulty of solving the problem, while keeping in mind the objectives of fostering competition and providing fair opportunities.

The 21 potential fields identified in annex C2 are more than is needed for practical implementation of this option, but the screening process can only be finalised by the decision makers themselves in accordance with their stated policies. The rationale for keeping or dropping specific fields is presented below. The fields are illustrated in Figure 5.1.

A.3.3 The Merging of Scheduled and Unscheduled Operations

The distinction between scheduled and charter operations is seen to apply less and less in today's passenger transport operations. Separate fields to cover each are therefore not proposed. This generic field will be broken up as detailed later in this section.

Similarly, scheduled and charter cargo operators do not justify two separate fields.

We consider that a field should be created for cargo to make the option symmetrical. At present, cargo is excluded from Heathrow (and Gatwick) at peak times by the TDRs.

Given that terminal facilities at airports rather than rather than runway capacity can limit traffic, we see no reason why cargo should not be given a field.

A.3.4 The Bilateral Field

A field of international non-EC routes established by bilateral agreements is indispensable to make the allocation system work.

A.3.5 General and Business Aviation

Whether a field should exist for general and business aviation operations is again a matter of policy. There is ample evidence of real needs in today's market place. Four to ten percent of the slots at Heathrow could eventually be used by business concerns to satisfy the existing and latent demand. Business aviation is presently using opportunities for slots outside the mainstream of airport scheduling and IATA conferences. We recommend this field; its size is a matter for policymakers to decide.

A.3.6 The Foreign General Field

The field of Foreign General operators caters to foreign routes not operated under bilateral agreements. Foreign carriers will be offered, under this Regulatory option, two choices. The first is to move to the (protected) bilateral field, where present bilateral agreements will be honoured, but with no expansion provisions beyond the ones guaranteed by treaties. The second alternative is to join the EC field. This will be available if there is full reciprocity with all carriers of all EC nations. One might envisage in the not too distant future the granting to all such foreign airlines full third, fourth, fifth, sixth freedom and cabotage rights. This specific Foreign General field may be needed by operators in transition. It should quickly disappear. We think this strategy supports current EC policy.

A.3.7 Long and Short Haul Fields

All routes operated by EC carriers fall within the EC field. These dominate the slot allocation system. For the purpose of protecting short haul from long haul carriers, two separate fields are advocated: EC short haul and EC long haul. These are needed to keep the balance between the two in line with the policy objectives.

A.3.8 New Entrant Fields

The fields for new entrants are central to any new slot allocation system because failure to satisfy them has posed the principal problem in current operations. The Regulatory option will intervene specifically in this area, to foster competition and provide fairer access to congested airports. The two fields of Small and Large New Entrants are recommended for ease of implementation and differentiation of policies. As long as the criteria are satisfied, there are definite advantages in keeping the rules very transparent and separate for small and large operators requesting additional slots in a restricted environment. These provisions are in line with the spirit of the policy, the internal system dynamics and the resulting market tensions. Some internal tension is unavoidable but is minimised by splitting into the large and small new entrant fields. These are analysed in detail in the description of the option and its market mechanisms.

Assuming for now that the Regulatory option needs a field for new entrants, we believe that two fields (small and large new entrants) are adequate to address the problem. In the Market Hybrid money option only the small new entrant field is needed.

A.3.9 Public Service Field

This is a field containing public service or third level feeder routes that are perceived as necessary for public policy reasons. The authorities have asked for a mechanism to support these operations. The USA have essential air service provisions along with commuter carrier designations. Minor domestic routes might fall within this category. The content of the field will only be determined after a review of policy on essential public service links to congested airports.

A.3.10 The Feeder Field

A specific field for third level carriers including commuter, regional and feeder services is not necessary. Protection could be provided by either the Public Service or the Small New Entrant fields.

A.3.11 The Thick Route Field

A field of thick routes is not deemed necessary if sacrifice provisions are to be left to the airlines themselves. They should be allowed to decide which slots they propose giving up for the slot pool, subject to modifications dictated by the agency. Major domestic and

EC routes are obviously potential reservoirs which could feed a slot pool. We believe that the identification of specific routes which would be subject to sacrifice is counteractive in principle and that legal considerations will make them difficult to implement.

A.3.12 The Network Maintenance Field

Slots to be assigned to protect the completeness and viability of fragile airline networks (network maintenance) can actually be incorporated into the field of slot management. There is no need to keep a special field for this function.

A.3.13 The Slot Management Field

The field of slot management contains the slots for short-term and day-to-day allocation to provide dynamic adjustment to operational conditions. This field is created to formalise the calculation of slots held in reserve to cater for surges in demand and operational disruption. This field will make totally transparent the process by which the ad hoc and opportunity slots are handled in the system.

A.3.14 Fields Required by this Option

The fields need by the Regulatory option are illustrated in Figure 5.1. The numbers below relate to those on that Figure. The concept of fields can be applied successfully to the regulatory option with a minimum of ten fields: (1) EC short haul, (2) EC Long haul, (3) public service, (4) Small New Entrants, (5) Large New Entrants, (6) Slot Management, (7) cargo, (8) GA and business, (9) Foreign General and (10) Bilateral. The distinction between Small and Large New Entrants is somewhat artificial but addresses real fears and concerns within and outside the EC market place. The Foreign General field is likely to be necessary in the transition phase, as a holding place, for foreign carriers not operating under bilaterals and not willing or able to give full reciprocity to EC carriers. They might eventually opt for the full competitive EC field, remain or join the bilateral category (a step backwards).

Note that we have suggested the creation of two more fields to meet potential policy objectives: are (7) cargo and (8) general and business aviation. These fields are not necessary according to current stated policies, but their existence and policy being applied to them would obviate the need for the remaining TDRs.

A.4 THE ROLE OF THE AGENCY

The agency in this administrative option is seen as a tool to translate formal policy objectives into the reality of every day operations for the airline industry at congested airports.

The administrative functions and relationships between the various operational and policy levels have been described generically in Chapter 4. The typical management structure of the allocation system is depicted in Figure 4.2 and differentiates between three important levels of operation: the policy function, the allocation function, and the coordination function which conducts the scheduling.

In the following discussion, the term 'agency' is used to highlight the concept of the administrative functions that have to be performed to ensure the smooth functioning of the regulatory option.

A.4.1 The Policy Function

The agency is the means by which the formal policy objectives translate the reality of every day management of the operation at a congested airport.

In the UK, for instance, the policy function is already in place within the Department of Transport and the CAA, and does not warrant the creation of another administrative body or layer of bureaucracy. As long as the present policy entity functionally covers all the elements mentioned in the top part of the Figure 4.2, the option will provide the necessary policy directions to the operational levels. Decisions on field sizes will be taken by the policy function. International negotiations will not be the responsibility of the proposed agency as such, but very close coordination with a number of government departments on these issues will be necessary to ensure overall conformity and convergence of policy decisions with those of the EC, and with international regulations and agreements. In providing its services and performing its functions, the agency acts on policies reflecting long, medium and short term objectives.

Gradual changes may be needed in the relative sizes of the fields, gradual changes in the stage lengths defined as long haul, and the gradual tightening of the definition of the bilateral field. These are long term moves which may be considered necessary to achieve overall goals in liberalising the market. The medium term covers the translation of such desires into 2 or 3 year plans to alter the present mix and meet allocation targets for selected groups of users. The short term is the tactical and operational translation of policies into the daily operation. The monitoring of slot actual usage falls under this category.

A.4.2 The Allocation Function

In the Regulatory option the allocation function is little changed from that operated today. The allocation would be fully independent. We believe that an independent allocator may be necessary, above the independent coordinator to carry out these functions.

The agency has an important and very visible role in the initial slot allocation by granting limited grandfather rights to incumbents. It will allow swapping within fields and, in some circumstances, between fields. This underscores the key function the agency has in defining the fields and the dynamic adjustment of them to keep up with market place developments and stated policies. The emphasis within this function is on short and medium term implementation.

The agency's most powerful role, however, lies in its implementation of the sacrifice elements of the option, both the initial and recurring. This is the most coercive and therefore controversial element of the Regulatory option. The agency will aggregate the sacrificed slots into commercially viable clusters, suitable for new entrants and selected candidates. The allocation function will draw heavily on the expertise of the coordinator and airline schedules to achieve this. In the Regulatory option these individuals will know the identities of new entrants; this simplifies the clustering task.

The agency also analyses the impact of its initial actions on the market place, letting it settle down and adjusting sacrifice quotas and rates as needs dictate . A cycle of 2 to 3 years is anticipated.

The formulation of allocation rules, the allocation itself, the arbitration functions as well as the market tracking are key activities. We detect that the existing coordinators have both the time and the desire to assume additional duties which will clearly transcend operational boundaries and take on political and controversial connotations. If individual nations feel that the airport scheduling committee (already an arbitration body) should assume the 'executive' allocation function through an independent allocator this may be better than the creation of another administrative position.

The major difference with today's environment is that the airport scheduling committees are not today responsible for slot allocation; the coordinator is. If the coordinators are willing and able to assume independently the allocation function between airlines, including potential sacrifice and confiscation duties, the two functions could remain merged. If the allocation function is not clearly defined and carried out according to the indicated philosophy, the system will fail and suffer from the same predicament as today. Problems arise today when highly professional schedules and planners have to enter uncharted and politically charged waters and allocate slots according to rules not always apparent to all concerned parties.

A.4.3 The Coordination Function

At the coordination level the scheduling of slots should be left to the professional staff of the background and calibre presently running the current scheduling system. The swapping of slots is based on a set of agreed rules. The bi-annual IATA Schedule Coordination Conferences would continue as at the present. The allocation of surplus slots recovered by the agency or through normal market movements would be made at the same IATA forum. The major difference, on a daily basis, is the tracking and monitoring of slot usage. This would be tighter than today and under the formal umbrella of the agency. This information will be needed both to implement the confiscation rules and to provide the information for the field sizing exercises.

A.5 THE OVERALL MARKET MECHANISMS

The principal 'market' mechanism of the Regulatory option is the mandatory annual sacrifice (if necessary) of a proportion of an incumbent's slots, with the agency giving priority to the creation of viable clusters of slots for new entrants and for other protected fields.

When analysing the effectiveness of the present system to generate slots for new entrants, it has to be said that no alternative seems to work if it is not triggered by external forces. The US cannot generate, out of their present system for domestic slots, enough recurring spare capacity for newcomers by relying only on fairly severe 'use it or lose it' rules. They initially resorted to a one time sacrifice of 5% of total slots in 1986 at three major congested airports. The confiscation by application of usage rules -65% usage in a 2-month period- is strictly enforced by the FAA and has not, as of mid-1991, ever created a pool of slots sufficient to satisfy the new entrants' requests. After 5 years of operation, the FAA is at present studying the possibility of tightening the rules even more.

The present IATA system presently generates real 'surplus' capacity, albeit small compared to actual needs. As mentioned previously, the observation of one scheduling season process has revealed the voluntary turnover of less than 1 per cent of total slots at Heathrow, one of the most congested airports. This was a relatively slack season in the middle of a world economic downturn. One can anticipate that the summer season will cause many more tensions. There is a recognition that relatively lax 'use it or lose it' provisions within the IATA/airport coordinator's system produce some inefficiencies in usage of slots. It appears extremely difficult to establish the wastage within the present system. Estimates vary between a low value of 4% and a high of 6-8%, depending on a variety of operational factors.

We have decided that we must use sacrifice as well as confiscation as an administrative allocation instrument in the framework of this option. We believe that changes at the margins will never provide a real solution to the problem; they will simply postpone the day of reckoning.

A.6 THE OPERATING CYCLE

A.6.1 Initial Allocation

Intended to involve as small a change as possible from the current system, the Regulatory options starts operation with grandfather rights granted to incumbent carriers subject to some limitations. Initial allocation would concentrate on achieving the objective of meeting the policies of providing opportunities for new entrants and fostering competition on monopoly and high profit routes, but not by direct intervention. New entrants would decided which routes to operate with their new slots. Allocators would only assist by constructing viable clusters.

The initial allocation would stand for some time, to allow incumbents to prepare for the sacrifice provisions. Swapping of slots within fields would be permitted, and between fields with permission of the agency. No money or secondary contracts would be allowed in such trading. Sanctions would be applied to any airline using money or value exchange to facilitate a slot exchange.

A.6.2 Slot Sacrifice

The granting of grandfather rights subject to limitations actually reflects the past development of the market. It endorses at least some of the commercial realities (success and failures) of airline operations for the last fifty years. It has been far from a free market regime; a plethora of regulations has inhibited the past and present market forces. As congestion has increased the market has dried; the trading of slots at congested airports is only about one third of the level seen at others with a similar balance of traffic.

A.6.2.1 Initial Sacrifice

The initial sacrifice is designed to create a viable pool of slots for new entrants. Some 10% of existing slots will be taken away from incumbents in a one-off procedure, but this measure could be mitigated for recent new entrants, or for those with some minimum number of slots. This 10% sacrifice is expected to take up the under-used slack in the present system and impose a modicum of pressure on incumbents.

If the incumbents were allowed free choice over which slots to sacrifice they would give away their least desirable slots. It may not then be possible to create commercial clusters of slots. Therefore, the nature and number of slots to be taken away from incumbents has to be at the discretion of the agency, arbitrary with respect to the market forces but in accordance with stated policy objectives. The overall principle of fairness will be the (potential) withdrawal of slots according to the proportionality of airline slot holdings at congested airports. The primary objective of this initial phase is not to penalise the present and successful slot holders under the IATA grandfather system but rather to inject meaningful competition into a stifled environment. The ten percent withdrawal would not apply across the board due to the inconsistencies the application of such a rigid rule might produce. Adjustments will have to be made according to specific circumstances, but the principle is set out as a policy guideline. This could be seen as fair, depending as it does on the size and distribution of the existing slots.

The issue of externally mandated sacrifice is the major element of contention in this option, which by definition, projects policy deep into the operation of the business of the airlines.

The formulation of the sacrifice rules would be difficult. It may be that the nature of a regulatory slot system would allow some of the details of negotiations to be kept secret.

It is also apparent that airlines with, say, 30% or more of slot holdings at a congested airport ought to be more vulnerable to withdrawal measures than a limited recent incumbent with a few slots a day. Objections to the sacrifice principle will never disappear, but they must be over-ridden if the status quo is unacceptable to the authorities.

A.6.2.2 Steady State Sacrifice

After the first programme, there would then be a moratorium on forced sacrifice while the market settled down and until the agency is able to assess the impact of the initial actions on the industry. The external environment will also change and this will demand a further policy review. It is expected that a cycle of about 2 to 3 years is needed to allow the sacrifice mechanism to operate and its effect to be measured against the policy objectives.

The long term objective is to provide a pool of up to 5% of the total number of slots every year at the discretion of the agency so that the current backlog of new entrants is reduced to manageable levels within each field. The triggering of the recurring sacrifice provisions takes place only when needed. The threshold is to be determined as the effect of sacrifice in achieving the policy objectives becomes apparent.

The 'use it or lose it' rules would be harsh and are addressed separately. They will produce some slots for the pool. Some slots will be given up voluntarily, and business failures will also generate slots. The agency will be able to invoke special procedures to call in slots if businesses are seen not to be able to use them.

A.6.3 Post Allocation Trading

The swapping within fields is permitted and outside fields with permission of the agency. No money or secondary contracts are allowed to be associated with trading.

A.6.4 Re-Allocation

A.6.4.1 Initial Re-Allocation

Re-allocation of slots from the pool by the agency would act rather like the TDRs, in that it would encourage operations towards preferred fields with a desired mix of new entrants of different types, and will reinforce other recent entrants. Initially, preference would be given to those carriers which had been unsuccessfully applying for slots for the longest period. We suggest the use of the simple historical precedence for new entrants as presently implemented by IATA and the scheduling committees. Lottery schemes have been applied in the past by the FAA to reallocate slots to new entrants. The random element is seen as an undesirable feature of a national slot system but the FAA used it as one method for delivering perceived fairness into the market.

A.6.4.2 Recurring Re-Allocation

Slots which are made available from the sacrifice procedures, together with those which come available through non-use (unwanted) or confiscation (broken rules), constitute the pool from which re-allocation occurs in accordance with the policies being followed by the agency. These might be arranged in some priority order, such as first satisfying new entrants disappointed last year, other new entrants, recovering failures from previous allocations or recovering damage to incumbents. These are a detailed variation of the historical precedence rules for new entrants described above.

A.6.5 Traffic Allocation Rules

The combined purpose of the proposed sacrifice and allocation rules is to provide the agency with enough power to impose the policy objectives. This power was previously applied through the TDRs, which used the IATA categories of operators. The Regulatory option uses fields which better reflects the type of intervention needed.

A.6.6 Airport Charges

The principle of airport charges would remain the same as at present, including some premium for peak times and popular airports.

A.6.7 Slot Operational Mechanism

The working framework used by this option will be the practical application of rules concerning the support of fields and associated priorities. The allocation procedures will be applied by an independent allocator, who will in turn check that the co-ordinator is correctly applying the swap rules.

The Department of Transport and CAA fulfil the policy function and they will control airport charging and international negotiations.

The EC and national monopoly control agencies will be able to check the balance within the limits set down by the policy objectives laid down by government.

It is envisaged that, following the current style and procedures of the airport coordinators and scheduling committees, the professionals in the airlines and airports continue to run the system on an operational basis within the new policy and control structure described in section A4.

A.6.8 Priority Rules

The slot rules defined for the fields will be automatically translated in the operational environment. The priority comes with the slot. Once acquired, the slot is guaranteed within limitations and provisions, precisely documented. Some of those provisions are already established, eg the 'use it or lose it' rules. The actual use of the slot on a particular day will of course depend on the operational factors, weather, ATC and other disruptions. These will be handled as they are today, with emphasis on the efficient operation of things that go right and rapid recovery of those that do not.

A.6.9 'Use it or Lose It' Provisions

As already indicated, the 'use it or lose it' rules would be harsh. The policy is to penalise inefficient operators quickly and take back slots, a scarce commodity gifted free in this option, which are not being fully utilised. The non-use for 3 times in a row for no valid reason, or the occasional non-use over a 2-week period according to a pre-defined set of criteria, and would be grounds for the withdrawal of the slot(s) by the agency. There would be an audit on the use of slots, to compare actual use of slots versus the bookings in order to assess holding operations of slots and real commercial needs. The number of seats or passengers landed per movement might also be a discriminator for losing slots, if smaller aircraft are observed to be deliberately being used to hold a slot, or if the carrier was not maintaining acceptable load factors.

Suitable notice would be given that a slot or cluster would be confiscated for the next season. There would be an appeal system. This would work progressively up through the agency.

A.6.10 New Entrant Status and Protection

These elements of the Regulatory option address the protection of entrants once they have been allocated a slot. This option introduces a very structured set of provisions for entrants. New entrants are a special category and are given extra protection. It is perceived as the most significant feature of the slot allocation scheme that fair access and opportunity is provided to congested airports. The reader is referred to Annex C.2 which contains full descriptions of provisions for new entrants (small and large).

It is recognised that this element introduces some tension in a system which is required to operate with fair government intervention. It is nevertheless an indispensable ingredient in the system to assure corrective action to the known deficiencies of the present system. Of course it depends on official judgement and is against natural market forces compared with a 'free' competition environment.

Once they have been allocated slots, new entrants will enjoy a set of provisions designed to protect them as their business develops. They will be supported for the first 2 or 3 years but will be exposed to the common rules after that time. This eases them towards the operating environment of all other users.

A.6.11 Brokerage

This slot system is a combination of heavy governmental intervention through the workings of an agency (strict regulatory control on sacrifice and slot allocation procedures through the fields). On the other hand, the airlines have freedom to trade (free swapping of slots) but they are restricted to trading within the fields, with exceptions granted by the administrative body. The resulting effect on the market place will be to position this operating element of the option in a fairly tight administrative regime.

A.6.12 Transaction Frequency

The day-to-day allocation of short term surplus is carried out by the agency to optimise the use of slots, a scarce resource. Considering its current priorities, transactions can take place and can be implemented instantaneously. The airport scheduling committees and coordinators would continue under the existing system to meet twice a year at the formal IATA scheduling conferences. The allocation of surplus slots would be made at

the same forum by the agency, following the same convenient and practical IATA schedule.
Every two or three years there would be an additional ‘sacrifice’ conference where major re-allocations are implemented by the agency.

A.6.13 Revenues

Some of the privileged imputed rents (no actual money) are extracted from the current incumbents by the redistribution of certain slots. The grandfather rights are subject to sacrifice, the full value is thus not confirmed. Incumbents will find it more difficult to use their imputed value to reinforce their position in other parts of the market.

A.6.14 Market Tension Summary

The shortages of slots inevitably produces tension in the system.

The proposed Regulatory slot allocation system is based on a logical design in all its components. The tensions between the allocation elements have been reduced to produce a smooth operating system, in each of its constituents and as a whole. Existing operational characteristics are amplified and made even more efficient than today, eg short term trading.

The market tension analysis reveals that this Regulatory option is characterised by an operational regime very structured in some of its elements while maintaining airlines' flexibility in others. This is as a result of having to apply an administrative solution. Policies and design goals have been achieved at the lowest practical level of internal tension between elements, in a system which, by definition, restricts the free functioning of the market forces at play.

The allocation (initial and recurring), trading and sacrifice elements are all consistent with an administrative scheme which solves problems by regulatory provisions.

The industry has been working in a very regulated environment. The granting (for no money) of rights to historical slot holders, in accordance to the past success and failures of the airlines over the last fifty years, is an administrative and arbitrary process . It is far from the free market, but it does give some consideration to the past and present market forces. The market is freed somewhat by the new entry provisions.

Post allocation trading is also characterised by some arbitrary restrictions. Swapping is permitted only within given fields, or outside fields with permission of the administrative body. The limitation of trade to within fields reduces the advantage of the grandfather rights in moving slots from, say, low margin short haul to profitable long haul routes.

The initial sacrifice provisions (10%) are perceived as relatively light as they use the current marginal spare capacity for most carriers. The fact the governmental decision makers can specify which slots ought to be given up in order to build up a viable slot pool is a very threatening measure to air carriers and extremely regulatory in nature. The harshness of the provisions is justified by policy objectives.

The steady state sacrifice of 5% is seen as very reasonable and affordable, on a macroeconomic scale, to most established carriers. It is not unduly restrictive. It will be exercised only in case of need. The overall effect of sacrifice provisions is a strong intervention in the market place, against established interests. It is the element creating most controversy with airlines and internal tension to this slot system but our analysis shows that there is no other way to implement stated policies of improved access of other parties to congested airports.

The procedures for reallocating slots to new entrants is a refined version of the TDR principle The new entrants will benefit from a 2-3 year protection cycle. This is very administrative in nature but meets the policy objectives.

Peak and off-peak pricing policies presently in place are perfectly adequate and consistent with stated policies and market conditions. The recent moves towards capping landing and airport fees (by the CAA and MMC) in order to protect consumers against (BAA) monopolist's power are actually adding an element of tension in a market; preventing the market from achieving free competition. Capping is made more restrictive than necessary by the 'single till' practice at airports and, as such, introduces stress into the system. Free market landing rates, on the other hand, are intrinsically incompatible with a regulatory system of this ilk.

The 'use it or lose it' provisions are harsh but are in synchronisation with the objectives. They keep optimise the use of scarce airport slots. Inefficient use of overloaded facilities is not permissible if the government is in charge of the operation through its policy arms. The present system has been lax in this respect.

The new entrant status (small and new) is most controversial and regulatory. We believe that the tension created by the introduction of such systematic features is a sine qua non condition of the success of this option in a non monetary environment. The tension is unavoidable and no other substitute can be found to allow new players into the arena.

No actual money is raised by the option. Incumbent (grandfathers) monopolists' rents are partially extracted under the form of sacrifice (5 to 10%). This provision is entirely consistent with policy objectives and is considered an acceptable price to pay for gifting the incumbents with property rights on the majority of their slots.

A.7 SYSTEM DYNAMICS ANALYSIS

Considered as a three element system, the Regulatory option can be made to work. By definition it depends on official judgement and intervention in all areas of its operation.

At the highest systems level, the Allocation element provides the main engine for introducing new entrants, to provide some tracking of the market, which is dominated by very stable grandfathers. The Sacrifice element is the instrument by which the agency creates the pool for redistribution. This is where the power of the agency is applied to satisfy the policy objectives, against the vested interests of the grandfathers. It dominates the option. It provides the main market tracking and damping. Instability in this area cannot be compensated for in other elements. The Trading element provides some market information and tracking, which is supplemented by the confiscation rules. Details of the individual elements are discussed below:

A.7.1 The Allocation Element

Because Allocation injects a minor modification to the existing grandfather rights, it provides slight instability to the market. The quality of market information is poor, so that the allocation of the marginal slots from the pool depends on the judgement of the officials, and their view of how best to apply the rules to achieve their interpretation of the latest policy objectives.

As would be expected with a Regulatory option, the tracking of the market is secondary to the achievement of the details of the policy objectives.

Damping within this fairly stable element is provided by the inhibition placed on post allocation trading and the uncertainty of the official motives in deciding on the details of a particular allocation.

a. Predictability of Market Reaction.

In the Regulatory option the allocation is carried out by the agency. There is little the airlines can do except swap later in the process. As most of the allocation will be within protected fields, the market reaction will be easy to predict.

b. Predictability of Official Reaction.

The essence of the allocation process is that it is an arm of policy. Although practices will be developed by the agency, predicting the outcome of an allocation, as in other public competitions, will be an art rather than a science.

c. Quality of Information.

The allocation process will provide good information on the current view held by the agency of the market. The veracity of this view will depend on the quality of the agency's information and the experience of its officials in interpreting this.

d. Speed of Market Response.

Because the market will be uncertain about the signals which the agency is sending, not knowing whether a particular allocation is designed to effect a short term adjustment or start a long term trend, the market response is likely to be slow.

e. Stability Under Fixed Rules.

If the rules of allocation remain constant, the market will become expert in predicting the result. Coupled with the slow response, this will create a very stable market, similar to that now operating under the airport scheduling committee, operating the TDRs and the IATA procedures and rules.

f. Stability of the Rules.

There will be a need for the agency to change the rules, if it is seen that the sacrifice rules are not effective in imposing the policy objectives. In general there will be pressure to keep the rules stable.

A.7.2 The Trading Element

The trading element plays a minor part in the operation of the Regulatory option. It provides some relief for market tensions, in that it allows aggressive airlines to track the market by moving from one slot to another. There is very little pressure on airlines to bring under-utilised slots onto the market. This is done by very harsh 'use it or lose it' confiscation rules.

The amount of trading is expected to be small and the quality of information low. The market is however expected to react quickly to what is observed. It will be possible for airlines to take actions to frustrate many strategies of others. It will be very difficult to get information on *any* secondary or hidden arrangements which have been used to facilitate swapping. These secondary agreements are widely suspected to be common under the current system.

a. Predictable Market Reaction.

With only limited swapping within fields allowed, and only between fields with the permission of the agency, market reaction should be predictable. As with the current system, however, some of the swapping may become very complex. It will also be difficult to ensure that secondary , hidden agreements are not made.

b. Predictable Official Reaction.

Official action in trading in the Regulatory option is limited to allowing or withholding permission to swap slots between fields. This is not likely to be predictable.

c. Quality of Information.

Information can be obtained about relative values if the trading activity is carefully monitored and analysed. This requires that the agency has knowledge of 'hidden deals'. Agency policy will be revealed by its attitude to swapping between fields.

d. Speed of Market Response

The results of swapping are published immediately after the biannual conferences. The market will respond quickly to this information.

e. Stability Under Fixed Rules.

In general trading will not put airlines under any pressure to change unless they have an aggressive policy of realignment in the market. They may do this to avoid the application of sacrifice rules or to avoid confiscation for non-use.

f. Stability of the Rules.

The trading rules are simple. The only variation is their application to swapping between clusters. The rules are not likely to be questioned or need to be varied.

A.7.3 The Sacrifice Element

Sacrifice is the major enabler in the Regulatory option. It provides the means by which the agency applies policy, by removing slots from those parts of the market which it considers over privileged. This is the main market tracking mechanism of the option. Sacrifice is also used to check any tendency for a single airline or group of airlines to obtain an excessive share of the market . This provides damping of the exploitation of the grandfather privileges.

Because of the great power of the agency in the Regulatory option, special measures will have to be taken to limit its powers of sacrifice, and to ensure that it justifies its actions, in a manner which allows the market to understand both its long term and short term sacrifice policy. Large, random changes in sacrifice policy will destabilise the whole system.

a. Predictable Market Reaction.

In the Regulatory option there is little airlines can do in response to sacrifice. It is likely that there will be automatic appeals against the decisions of the agency, but as its powers will be great and the repeated sacrifice is limited to five percent, it is unlikely that there will be much unconventional behaviour on the part of the airlines.

b. Predictable Official Reaction.

The sacrifice element is the most powerful instrument which the agency has to enable it to dilute the power of the grandfathers. It is likely that the policy of sacrifice will have to be modified constantly as the effects of the process are revealed. The unpredictable nature of the official action is a major destabilising feature of this option.

c. Quality of Information.

Because of the effect that sacrifice will have on the businesses of large, powerful, international organisations, it is expected that the agency will present a fully argued case every time the sacrifice details are published. This will provide a good insight into agency policy and current thinking. As with allocation, the difficulty will be to determine the difference between short term adjustment and long term trends.

d. Speed of Market Response.

Because the level of sacrifice is imposed, the airlines can predict the secondary effects easily. The industry is highly geared and thus very susceptible to small changes in load factor and route structure. The airlines are likely to respond very fast, only being lightly inhibited by the uncertainty of the long term policy.

e. Stability Under Fixed Rules.

If the rules of sacrifice were stable and known, the incumbent airlines could take some steps to reduce the effect of losing their slots. The system would then be fairly stable.

f. Stability of the Rules.

The effect of the powerful sacrifice rules is such that they are likely to come under constant attack from all quarters. Everyone may agree on the need to encourage new entrants. Incumbents are not likely to take kindly to their core business being under constant attack to provide the means. The process will be subject of political pressure from within the UK, the EC and from within all other international parties.

To moderate this pressure to keep changing the sacrifice rules it is suggested that there should be a declared moratorium on the sacrifice element after two or three years, to allow the market to settle down and the effects of the changes assessed by the agency. The business environment of the airline industry is very sensitive to small internal and external changes. It is unlikely that a stable set of sacrifice rules will emerge from the Regulatory option, but holding a major policy conference every 3 years would help to stabilise this element of the system.

A.7.4 System Dynamics Summary

From a systems dynamics perspective, the Regulatory option works because of its consistent harsh level of intervention. The allocation element provides the main engine for introducing new entrants, to provide some tracking of the market, which is dominated overall by very stable grandfathers. The sacrifice is the instrument by which the administration creates the pool for redistribution. This is where the power of the regulator is applied to satisfy the policy objectives, against the vested interests of the grandfathers. It dominates the option. It provides the main market tracking and damping. Instability in this area cannot be compensated for in other elements. The trading element provides some market information and tracking, which is supplemented by the confiscation rules.

A.8 POLICY OBJECTIVE ANALYSIS

As would be expected of an option which assumed that the administration would be set up to control all aspects of slot allocation in detail, this Regulatory system supports most of the stated policy objectives, as shown by the detailed decomposition which follows.

A.8.1 Commercial Aspects

1a. Interests Outside the EC

The powers given to the agency under this Regulatory option would allow all the interests of countries outside the EC, which had bilateral agreements, to be protected. The field scheme proposed would allow special rules to be applied.

1b. Interests Of the EC

The field system would allow rules to be applied which protected the EC's interests, and excluded all those who did not reciprocate with suitable arrangements to allow EC carriers access to their markets.

1c. Interests of the UK

It would be possible to protect the UK to some extent, in that some of the interpretation of the rules governing the make-up and running of the fields would not have to be made public. Also, the implementing of the sacrifice and allocation rules could be adjusted to favour those parts of the UK which were to be supported. It is not proposed that there should be fields which would be reserved for UK operators.

1d. Interests of Airlines

The sacrifice rules would act against incumbents. The allocation rules would favour new entrants. Fields for Public Services would be open to selected operators. The agency has the mechanisms to be neutral to airlines in its implementation of the policy objectives.

1e. Interests of User Groups

With a scarce resource to be rationed, compromises have to be made. The agency has within its power the tools to force airlines to deliver the service which the agency decides the user wants.

A.8.2 Operational Aspects

2a. Efficiency of Airports

There would be little direct action which the agency could take to ensure that slots were used in a way which optimised the use of the airport facilities. It would be possible to favour large aircraft and to place slots in the sacrifice zone in rank order of passengers landed, as well as by the use of the actual slot. Compromises would have to be made if it was policy to support thin routes, or for social or traffic balance reasons.

2b. Efficiency of Slots

By using the harsh confiscation rules, together with the sacrifice and arbitrary allocation system, the agency would have absolute authority to impose the efficient use of slots on the incumbents.

2c. Efficiency of Aircraft

Aircraft efficiency would be a secondary consideration against the other priorities which were set. The airlines would have to operate within the environment which was set by the agency.

A.8.3 Use of Facilities

3a. Balance Between International Operators

It would be possible to impose a regime which ensured that any required balance was maintained between international operations and operators.

3b. Balance Between EC Carriers

The system is specifically designed to maintain a balance between carriers of similar types, operating in the same environment. It introduces new entrants to established business areas, while forcing sacrifice from incumbents. This can be imposed down to the detailed level of specific routes and timings.

3c. Balance Between National Carriers

It would be difficult to maintain a balance between national carriers, unless they were of similar types. It would be possible to balance individual routes by selective sacrifice and allocation. This might be countermanded by the EC regulations if it was too blatant.

3d. Operating Category Balance

It will be possible to relax the TDRs and re-impose a different set of criteria for defining categories by using the field system. The agency has the power to impose whatever balance is required, because it can forbid trading between fields unless this is seen to be furthering the policy objectives.

A.8.4 User Aspects

4a. Cost to the User

In the short term the option will encourage the development of cheaper services by new entrants, which wish to start operation on thick, profitable routes. Incumbents will resist these with their own proposals. It may be that the threat of a price war will discourage small users and so moderate the market forces in the longer term.

4b. User Choice

The allocation element will allow the agency to encourage choice on any route it desires. The agency will not have the resources to subsidise routes, so will depend on the perception of the airlines for financial judgement. The airlines could be motivated to operate routes and services in exchange for favourable treatment in the sacrifice and allocation procedures.

4c. User Choice Convenience

The agency would be able to favour those airlines and services which provided the user with the most flexibility of choice. The judgement of what the user wanted would be that of the agency. A powerful user group would be required to assist in this judgement.

A.8.5 Control of Monopoly

5a. Monopoly of Airports

Since no money is extracted from the slot system, airports would be able to set their own charges. The agency could lower the value of traffic to the airport by encouraging small aircraft with low premium loads. This would break the efficiency objectives. Nothing in the proposed procedures for the Regulatory option would allow the agency to refuse a slot if one was available and the route had been authorised. Other means would have to be found to control airport monopoly.

5b. Monopoly by Airlines

The sacrifice and allocation procedures, coupled with the application of the sacrifice rules, would give the agency very great powers to control monopoly. As the agency has no money to dispense, other ways must be found of supporting weak airlines who may be taken over by a potential monopolist.

A.8.6 Control of Cross Subsidy

6a. Between Airports

The Regulatory option would provide little control over cross subsidy between airports. It would have no power to direct traffic away from an airport which was making monopoly rents and using these to maintain other airports unfairly.

6b. Between Routes

There would be some control of cross subsidy of routes, by the encouragement of competition on routes which were, in the opinion of the agency, the source of excessive profits. On the other hand the agency would be dependent on airlines using some of these excess profits to operate socially desirable services.

6c. Between User Categories

There are no mechanisms proposed to prevent cross subsidy between user categories, except to encourage competition on popular premium user routes. This has to be tempered with the need to provide slots for thin, non premium services.

A.8.7 Generation and Use of Proceeds

7a. Source of Proceeds

The Regulatory option involves no money being exchanged for slots, apart from that involved in hidden, secondary agreements. The manner in which the monopoly rents are extracted from the system will not be obvious. The aim of the policy is to try and ensure that this extraction is fair. The model needed by the agency to prove this fairness has yet to be developed.

7b. Use of the Proceeds

The assumption imposed on Stage Two of the study was that all proceeds would be taxed away. As the proceeds are not readily identified in the Regulatory option, no method of taxation can be devised.

A.8.8 Policy Objectives Analysis Summary

As would be expected of an option which assumed that the administration would be set up to control all aspects of allocation in detail, this regulatory system supports most of the stated policy objectives.

Major shortcomings arise on the following four objectives (out of 22) where it appears that this option does not offer sufficient support for official policy.

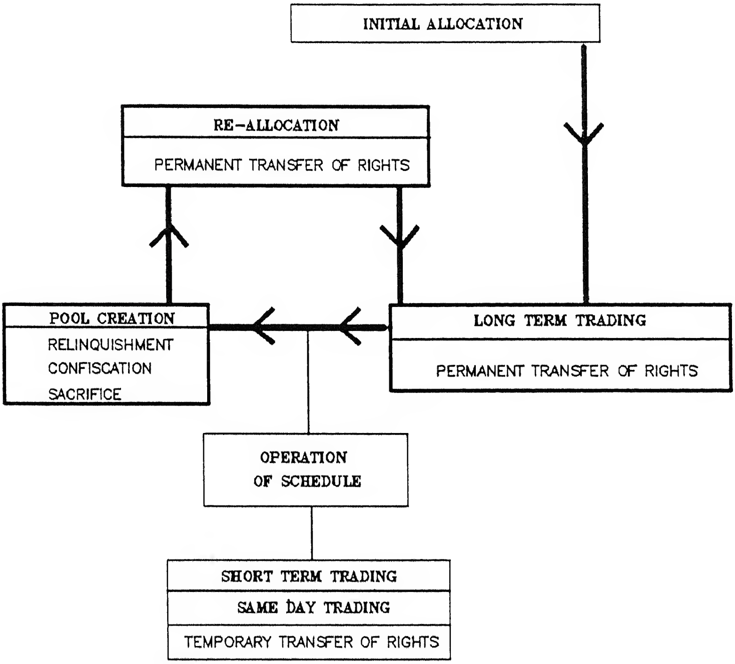
a. The interests of the UK would be difficult to advance in an overt way with this option. The rules governing fields and the implementation of sacrifice and allocation rules would have to be neutral. There would not be profit to the Exchequer, and UK airlines which have based themselves on congested airports would be threatened by the whole range of new entrants categories.

b. The policy for balancing national carriers will not be supported. It will be difficult for the administration to differentiate between national and EC carriers.

c. The option itself provides no inhibition to airports exploiting their monopoly. The premium for the shortage of capacity can accrue to the congested airport. Other methods will have to be found to control this monopoly.

d. The Regulatory option does not facilitate the identification of exactly where the profit from the shortage of slot capacity is being extracted from the system. As there is no money to tax, the requirement that it should be taxed away is also not met.

FIGURE 4.1 FUNDAMENTAL MECHANISMS OF SLOT ALLOCATION SYSTEMS



- ONCE THE SYSTEM IS ESTABLISHED IN THE LOOP IT BECOMES A CONTINUOUS PROCESS

- AS THE ENVIRONMENT CHANGES IT IS NECESSARY TO ADAPT THE RULES OF EACH OF THE ELEMENTS

FIGURE 4.2 TYPICAL MANAGEMENT STRUCTURE OF THE ALLOCATION SYSTEM – BOTH OPTIONS

FUNCTIONS AND RELATIONSHIPS

[ ]=MARKET HYBRID

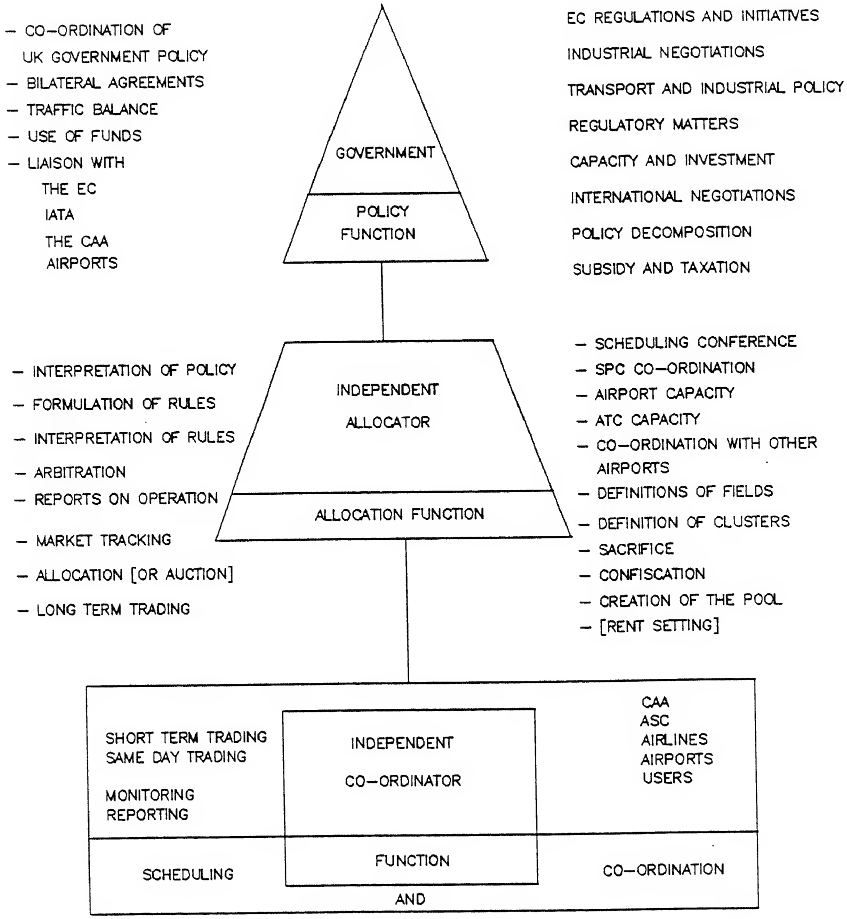
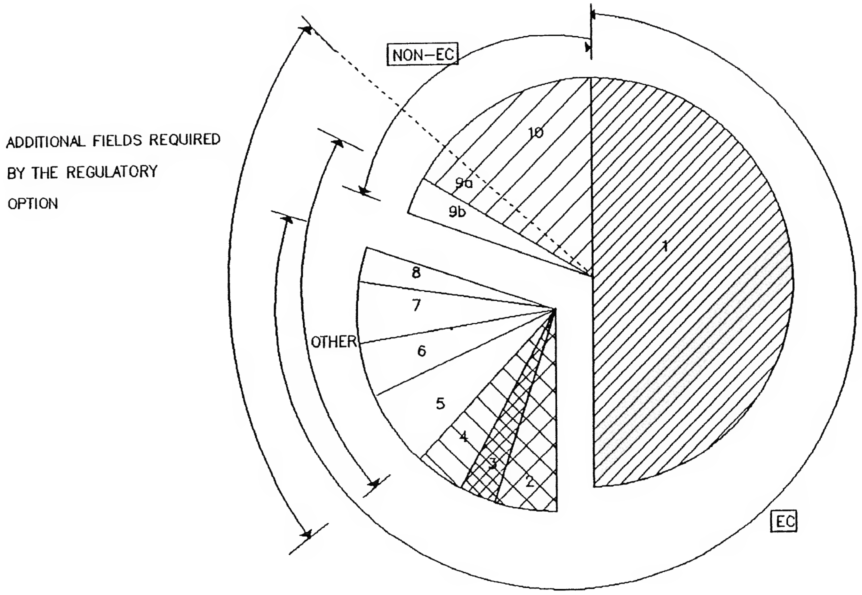


FIGURE 5.1 TYPICAL ALLOCATION TO FIELDS



	Regul.	Mkt.	
1. SHORT HAUL	✓	✓	
2. LONG HAUL	✓	✓	
3. PUBLIC	✓	✓	
4. SMALL NEW ENTRANT	✓	✓	
5. LARGE NEW ENTRANT	✓		OTHER
6. MANAGEMENT	✓		
7. CARGO	✓		
8. GA & BUS	✓		
9. FOREIGN GENERAL	✓		
10. BILATERAL	✓	✓	

NB.
9a. Part of Foreign General Field, in transition to a Bilateral
9b. Part of Foreign General Field, in transaction to an EC field.

Note: Field sizes are for illustrative purposes only.

FIGURE 6.1 SEQUENCE OF OPERATION OF SLOT ALLOCATION

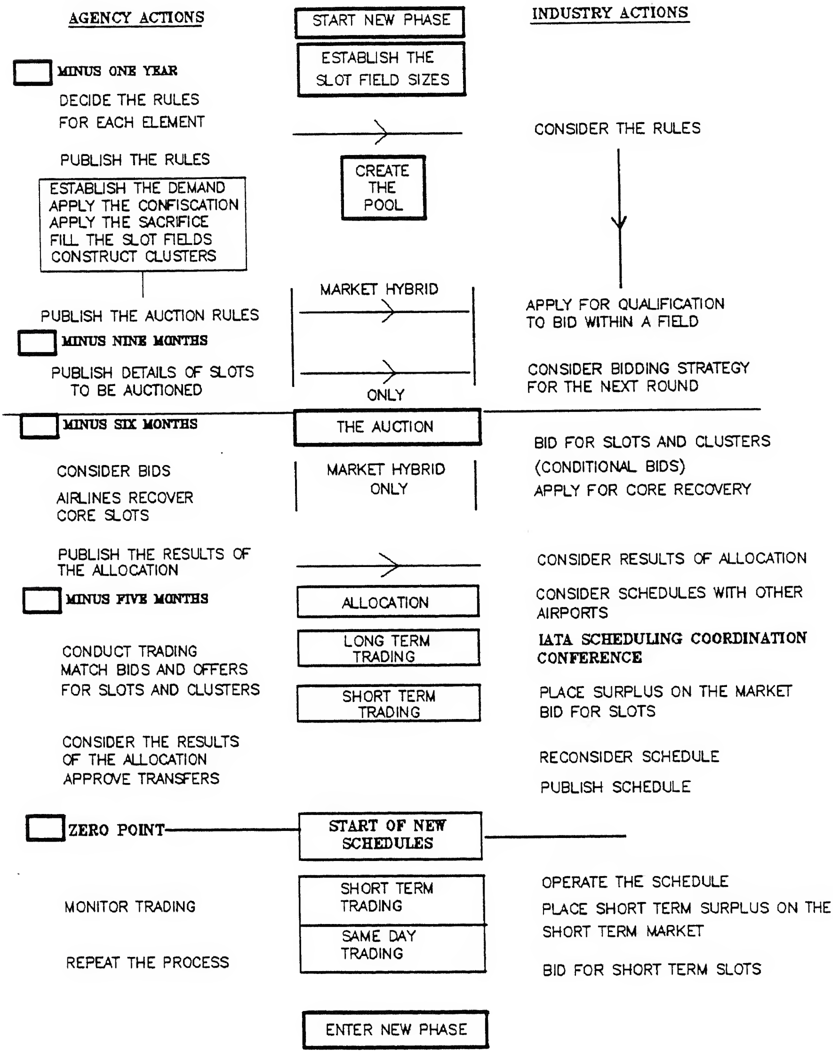


Figure 6.2 REGULATORY OPTION–OVERALL OPERATION MECHANISMS

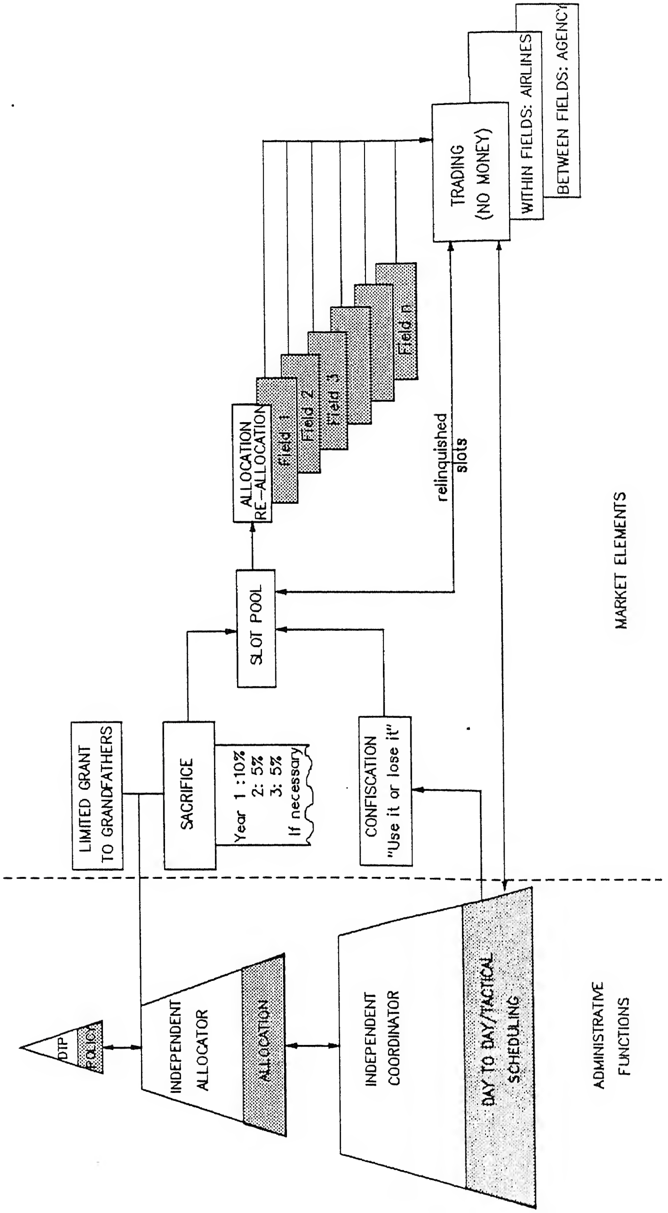
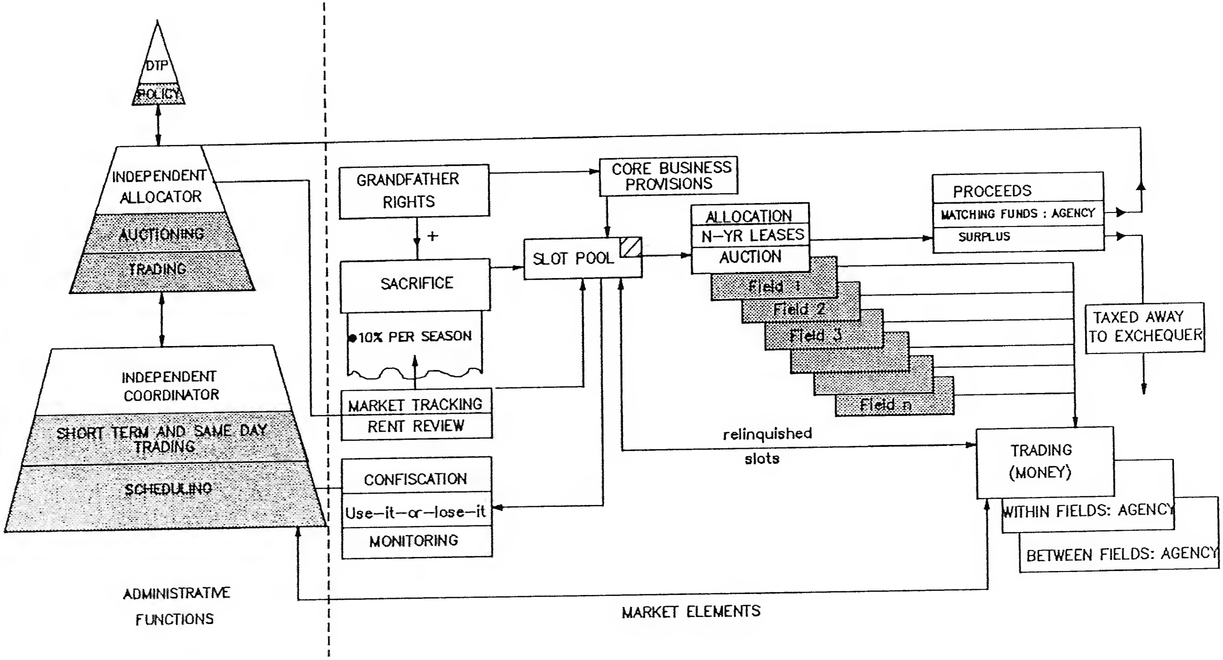


Figure 6.3 MARKET HYBRID OPTION—OVERALL MARKET MECHANISMS



ANNEX B

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DETAILED DESCRIPTION OF THE MARKET HYBRID OPTION

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DETAILED DESCRIPTION OF THE MARKET HYBRID OPTION

B.1 INTRODUCTION

This Annex expands on the details of the Market Hybrid option, as described in general terms in Chapter 6.

Each element and sub-element of the slot allocation system is analysed and explained. The reasons why individual features have been included is discussed. An indication as the importance of each feature is included, as is the sensitivity of the allocation system to small changes in any element. A diagram of the option is at Figure 6.3, which, for completeness, is included with all the figures from the main report at the back of this Annex.

B.1.1 Outline of The Market Hybrid Option Studied

This Market Hybrid option is a monetary option which is structured to allow the market to decide the value of a slot or a cluster of slots, within the confines of a system which applies administrative constraints, so as to ensure that the details of the policy objectives of the authorities, both in the UK and the EC, can be seen to be satisfied.

This option was one of two options chosen by the Department of Transport for further study out of 4 option types which emerged from Stage One of this study.

The option is positioned about half way between a free, unrestrained market and a system which would depend on detailed control by official action in every aspect of its operation. It uses the auctioning of 7 year leases as the allocation method, with free trading allowed within fields, the agency acting as broker. Slots will be progressively introduced to the market over 5 years. Slots will go to the highest qualified bidder but there is some protection for incumbents; there are rules against non-use and harsh rules against speculation. Special provision is made for non-EC, bilateral operators.

B.2 LAYOUT OF THIS ANNEX

An attempt has been made to make this annex a relatively free standing document in describing the Market Hybrid option. This annex describes the general principles which have governed the construction of the option. It then reviews the concepts of fields, clusters and slots detailed in the main text, as they apply to this particular monetary option.

The role of the agency, with its policy, allocation and coordination functions is then described. This is followed by a detailed description of the logic behind the auction process.

The option is then described in detail; the sequence of allocation, trading, sacrifice and re-allocation are taken in order. Each element is taken down to as much detail as has been developed in the time allocated to this phase of the Study.

At each point an attempt has been made to highlight the key features of each sub-element, and how they contribute to the overall strategy concerning the enabling of the policy objectives and the operation of a practicable system. The way in which each element contributes to a coherent whole, to produce a system with low internal tension between the elements, is also highlighted. Some of the text is necessarily repetitive, to make each sub-section free standing. Finally, the option is reviewed to highlight its main features, both good and bad. These are discussed in Chapter 7 of the main report.

B.3 GENERAL PRINCIPLES OF THE OPTION'S CONSTRUCTION

B.3.1 The Principles of Intervention

Money is a powerful discipline but the introduction of money into any control system is a potential source of tension. In order to facilitate the smooth operation of the option, it is important that the level of official intervention is both consistent and appropriate throughout the system. Every effort should be made to ensure that the introduction of an unduly interventionist policy in one area followed by an uncontrolled compensation in another does not destabilise the whole system. On the other hand, if some outside influence, such as a binding bilateral agreement, demands arbitrary administrative action, a compensating relaxation must be found, close to the affected area, in order to stabilise the system. As the option is to be placed at the mid-point in a fairly free market, it is also important that any administrative intervention is restricted, wherever possible, to the upper policy and allocation regions of the operation. Rules for the operation should be set in fairly general terms by the agency, and then left to work through the system. Fine details of the control, composition, powers and method of operation, will have to be developed if the design of this option progresses to further stages. The administrative functions of the agency can be kept small if the logic outlined above is followed.

Although the agency will need wide powers to control the operation of the system, after the agency has set the broad outline of the operational rules, the system should be left to operate is as free a manner as possible. The temptation to fine tune the system by the imposition of very detailed regulations should be resisted. The market must be allowed to express itself within the policy objectives clearly laid out in advance by the government policy bodies.

B.3.2 The Use of Fields

The TOR's require that this option should work in a mixed EC/world market. As is explained in Chapter 5 this requires a formal method of segmenting the market, so that one set of liberal rules can be applied to the EC market, while another set of parallel rules apply to the rest of the world. For the purpose of this report these segments are named fields.

The policy objectives demand a mechanism to control the distribution of traffic using the EC airports and so a number of fields have been constructed. By auctioning leases within these fields the policy objectives for control are met, while the effect of this official intervention can be judged by the difference in prices bid for equivalent slots in different fields. This difference also allows the allocator to judge the latent demand for slots in the different markets. The full range of fields is described in Chapter 5 and Annex C. The fields used in this option are described in Chapter 6 and later in this Annex.

The use of fields inside the EC slot market also allows direct comparison to be made when calculating the fair rent to be charged to a non-EC bilateral airline. Slots in the EC Long Haul field will command a certain price. Non-EC operators can reasonably expect to pay the same price for an equivalent slot. Neither party is then disadvantaged.

Airlines which invoke bilateral agreements to protect them from sacrificing slots to the auction process are advantaged. To compensate for this, we propose that they be confined to their bilateral field and not allowed to bid into other fields. This would encourage them to give up the privilege of the bilateral if they valued say, fifth freedom rights in the EC.

B.3.3 The Use of Clusters

The definition of clusters is given in Chapter 4. They are a recognition of the current allocation process, which groups slots in various ways to permit regular scheduling. The clustering of slots reduces the allocator's task by reducing the number of slots to be auctioned. The actual construction of clusters is complex however, and we have highlighted these problems in the sections covering the role of the agency in this option. At one extreme, individual slots could be auctioned, to be gathered up by airlines acting as brokers, into viable clusters. At the other extreme very few clusters might be auctioned, with the airlines, once again acting as brokers, breaking these up and selling on the surplus.

To keep the structure of the Market Hybrid consistent the allocator has to remain at the centre of the broking activity, both during allocation and Long Term Trading. We recommend that concerted efforts should be made to exploit the wide experience of the current coordinators to construct clusters which are likely to be attractive to airlines operating in the various fields. This process is described in Chapter 4.

B.3.4 The Use of a Slot

The definition of a slot is given in Chapter 4. Once a money value has been placed on a slot its definition becomes doubly important. Currently slots can carry limitations on time, size, passenger load, as well as minimum gaps between landing and take-off, to allow for turnaround. With the introduction of money, airlines will be increasingly protective of their value. Time will become of the essence. They will try to get limitations removed to increase their value. They will resist extra limitations which may have to be imposed to allow ATC and airports to operate safely and efficiently.

We believe that the coordinator and the allocator should be given wide arbitration powers to prevent continual legal challenges to the operation of the system. Only in this way will the inherent advantages of the current, flexible system be retained.

B.4 THE ROLE OF THE AGENCY

The general role of the agency is described in Chapter 4. The agency has the three levels of policy, allocation and coordination. This section describes the unique function required to support this Market Hybrid option. The structure of the functions is laid out in Figure 4.2.

B.4.1 The Coordination Function

The Market Hybrid requires a sharp differentiation of the three agency functions. We consider that the coordinator should be free of the political and monetary pressures which will come with the use of money. He must be given the freedom and authority to negotiate with airlines and airports to achieve a schedule which is satisfactory to them both. The current system depends on the realisation by all parties that the ideal is the enemy of progress. If the coordinator is involved directly in the mechanisms of rent and sacrifice, he will lose this impartial image. We are satisfied that the current coordinators only wish to be appliers of rules to facilitate scheduling. Only in the matters of the construction of clusters, the keeping of records of use, the conduct of short term and same day trading (defined below) should the coordinator take on duties in addition those he now performs.

B.4.2 The Allocation Function

The major features of the Market Hybrid option are the introduction of monetary auctions into the EC fields and the balancing of the rents charged to non-EC airlines. This will require a special group to collate the information concerning all the slots, clusters and fields. The prices bid at auction, the relationship between slots in the auction market and those outside, must be recorded.

The physical process of organising, running and controlling the after-trading of the auction is described below. This will require a small dedicated team. Much of the process can be automated once the system has been defined and implemented.

The modelling of the market in order to try and predict the outcome of the auctions and the effect of changing field and cluster sizes will also have to be controlled.

These tasks, together with those tasks currently carried out by the coordinator concerning the capacity of the airport, the ATC system and the arbitration over allocation disputes, should be given to a dedicated allocation function.

This allocation function would also be responsible for the interpretation of the details of the policy directions passed down from the policy function, as indicated in Figure 4.2.

B.4.3 The Policy Function

The policy function of the Market Hybrid is essentially the same as in other options. As this is a monetary option it has to control the flow of funds through the system, and would no doubt be accountable for authorising the acceptance of negative bids (implying subsidy) and approving the detailed structure of each of the fields.

Apart from this it is likely to review national and changes in bilateral agreements and EC policy. It is likely to be made up of a small committee, probably chaired in the UK by a senior member of the Department of Transport. Other government departments, airlines, airports and user groups, would no doubt have to be represented.

B.5 INITIAL ALLOCATION ELEMENT - FIELDS

As has been described in Chapter 4 and illustrated in Figure 4.1, all allocation systems have the four elements of initial allocation, trading, sacrifice and re-allocation. This section introduces allocation; it is followed by details of the auction process which is the method of allocation used in this option.

Allocation of slots is the major instrument of policy within any slot allocation system. It is this element which decides what priority and protection shall be given to which particular service, route, operator, category, airport, nation, or groups of these.

The Market Hybrid Option has two mechanisms for allocation. Firstly, the administrative process of gathering slots and clusters of slots into fields, each of which is constructed and operated under a specified set of rules. Secondly, the contents of each field are leased to the highest qualified bidder, who has to operated within the fairly strict terms of the lease, paying a variable annual rent to maintain the lease. The details of the auction are in B6. Fields and clusters are described in Chapter 4 of the main report, but are summarised below.

B.5.1 The Definition of Field Contents

A field has three elements in its make up: who is allowed to bid for slots within the field, what slots are contained within the field, and what rules apply to the operators of these slots.

B.5.1.1 Qualified Bidders Within a Field

There are a number of types of potential bidders for slots which the authorities may wish to include or exclude from a particular field. This may, for instance, be to protect a particular set of operators who may be vulnerable, it may be to provide a public service, or to act as a mechanism for introducing competition into some element of the market.

Some operators may have to be placed in a particular field because of a government's international obligations, which require that they be given specified rights and protection. Other operators may qualify for certain fields because of the nature of their business. Scheduled cargo or unscheduled business and general aviation operations may be candidates for separate fields, if the policy objectives towards these cannot be achieved by any other means. To protect against the build-up of monopoly, some operators may be excluded if they already hold more than a maximum percentage of the slots within a particular field.

The decision on the number and qualifications needed to join a field is an iterative process which has to be conducted by the allocation function, and which emerges from consideration of the number of different sets of operating rules needed to allow the option to function as required.

B.5.1.2 Slots Contained within Fields

The whole range of fields is set out in Annex C.

Any field has to have the differentiation and capacity to satisfy the policy objectives attributed to it. A field has to contain the number of slots and clusters of slots which will allow the qualified bidders to build up and maintain viable services. The details of this requirement may be different for different types of operation. For instance, the clusters for Short Haul operations may have to be larger that those needed to support Long Haul operations. Obviously the total number of slots in all the fields cannot exceed the total available. The balance between the size of the fields is a mechanism in this option.

The more the authorities feel the need to intervene, the more exactly will have to be the match between the clusters demanded and those produced. A range of cluster sizes may have to be put together by the agency at each auction. One of the functions of a field is to prevent undesirable domination of the market by one operator or type of operation. It is possible to reduce the number of fields required, by applying rules to limit the proportion of any single field which may by owned or controlled by a single operator, or group of operators acting as if in concert. Our analysis of the policy objectives indicates, as explained in Chapter 6, that more fields will be needed to differentiate the EC market.

B.5.1.3 Fields Required by this Option

This option is unlikely to need more than 6 fields:

a. EC Short Haul Operations
b. EC Long Haul Operations
c. Public Service
d. Bilateral Operations
e. Small New Entry Operators
f. All Others

The use of money will, in itself, allow the market to determine which services are operated in the "All Others" field. This will include cargo, GA and unscheduled services. Several other fields needed by other options will also be unnecessary.

B.5.1.4 Rules Governing Different Fields

The details of the rules governing each field are fundamental to the operation of this option. They will be worked out progressively as the design of the option is developed.

Each of the field types described above has its own sets of rules. In practice most of the rules are the same except that in certain fields there is free competition and in others this is restricted or there is none.

In the case of the Bilateral field, for instance, it is expected that the rules will be very restrictive and non-EC incumbents will not be qualified to enter any other field. They will be charged the same rents as those the EC airlines are paying for equivalent slots but will not enter the auction process.

It may be that an additional Network Maintenance field will be needed if clustering is not practicable. It is likely to be most complex to operate in this free market. Many operators are likely to try to invoke this field to justify priority for maintaining or obtaining specific slots. Entry to this field will be restricted to operations which will be unviable, as opposed to somewhat degraded, if a slot within a specific time window is not provided. Every effort should be made to avoid the need to create this field. We have assumed it will not be necesary.

Two specific measures will be needed to allow for the management of commercial disruption. They are in effect short term pools rather true fields. These are:

a. Short Term Trading Pools - This pool would be for slots which are given up by incumbents and placed on the market, becoming available on short leases prior to the formal auctioning of the remainder of the lease. Slots may also become available as a result of liquidation of airlines or the confiscation of slots because of breakage of the terms of the lease. The confiscation procedures would be fashioned in such a way that the notice of confiscation would normally coincide with the auction sequence. However, as confiscation would normally be because of non-use, this category of field is needed to ensure that the slot potential of the particular airport is fully utilised. It may be necessary to have very relaxed rules to ensure that these slots are taken up at short notice.

b. Same Day Trading Pools - Potential waste occurs when for any reason it becomes apparent that a slot will not be used by the incumbent. It should be made available at short notice to the highest bidder. As the priority is to use the scarce runway facility, there are not likely to be any restrictions within this field, as long as the operator can show that the complementary airport and ATC facilities will not be disrupted by the particular operation he intends to run.

B.6 THE AUCTION PROCESS

The option uses the auctioning of slots as the primary method of allocation and for determining the market value. The following is a description of auction process to be used. The argument supporting the principle of auctioning leases, using sealed bids with the highest bid winning, is laid out in Chapter 6.

B.6.1 Selection of Fields for Auction

Prior to the holding of an auction, the selection of both the contents and the rules of governing the various fields will be decided by the agency, as described in section B.5 above.

B.6.2 Identification of Elements to be Auctioned

The allocation and coordination functions of the agency will identify and agree the slots and clusters for auction within each field. The auction will be filled using the allocation procedures (B.5) and sacrifice prinicples (B.8). The agency will also decide its policy for buying in slots and clusters.

B.6.3 Conduct of Auction/ Trading

B.6.3.1 Main Auctions

Auctions involving the major elements will take place twice a year. To allow airlines to develop strategic business plans, each auction will be restricted to some twenty percent of all the slots available in that season. This will allow all the slots to be in the market after 5 years from the start of the transition. During the transition auction slots will be those arising from new capacity, sacrifice and confiscation. Once the system is mature, the pool will also contain expired leases. Holders of leases may take advantage of this Main Auction to sell surplus leases which are surplus to their requirements; the rules governing this are dealt with under Trading in B.7.

B.6.3.2 Intermediate Auctions

The confiscation rules, and the effect of an airline cutting back or going into liquidation may bring a large number of slots on to the market at short notice. In normal circumstances the agency would only allow the sale of short leases, to expire at the end of the next auction round. To ensure that slots were not left unused, a special intermediate auction could be held if the demand was great. This would be exceptional because the process would disrupt the logical sequence of sacrifice and valuation designed into the main auction schedule.

B.6.3.3. Trading Out of Sequence

Post Allocation Trading is dealt with under a separate heading in B.7.

B.6.4 Timetable for Auctions

Auctions are organised to follow the current IATA timetable so that operations could normally start six months after the date of acceptance of a bid. Planning would start in January for an auction in June, whose results would be implementable in the following January.

Airlines could use trading to shed slots which were under threat at auction, and which they did not intend to bid for. They could also use trading to take over a slot, or a close slot, to allow a successful bid to be exploited early.

B.6.5 Setting of Field Policy

The details of the policy and rules to be applied to each field would be published as an official statement. This statement would cover all aspects of operations which might influence an airline's decision to bid within an field.

B.6.6 Setting of Field Contents

The required content of each field, to be in place following the outcome of the next auction, would be published as an official statement. The trigger levels for official intervention in the auction would not necessarily be made public, although it would be desirable to do so if authorities felt if necessary to keep control of the auction process.

B.6.7 The Gathering of Field Contents

The gathering of the slots to be auctioned within each field would be accomplished by the use of pool slots within any field, and by the transfer of slots from other fields, according to an agreed priority. The gathering of confiscated and sacrificed slots are described in the relevant sections below.

B.6.8 The Setting of Slot Rents

We suggest that there should be rent revisions every two years. Revisionary rents for slots and clusters of slots is a fundamental tool for achieving policy objectives and for stabilising the market against monopoly forces and changing economic conditions.

The aim of this option is not to extract the maximum value of the slot for the agency. It does aim to prevent profiteering. The rents initially do not reduce the total cost of a slot but have the effect of depressing the capital value of the leases. This will make entry into the market cheaper. We have been advised that it would be reasonable to aim to set rents at about one half the annualised capital value of the leases. This would require the tracking of these capital values. If the rents are set too low there will be a temptation to speculate in slots, which might then cause them not be utilised efficiently.

High auction prices will be discouraged by the knowledge that they will be reflected in a rent increase at the next round. Too great an increase in rent might cause the value of a slot to become negative. This is the downside of the speculation. There is also a chance that the value of a slot will become negative towards the end of the lease period. This would encourage airlines to shed short leases into the market early enough to extract some value from them. The effect may be that airlines only use about 5 years of their 7 year leases.

B.6.9 Publication of the Rents

The use of rents and the method of revision is fundamental to the working of this option. The levels of rents being charged for all slots would be published. They would vary within a field according to the demand (the day and time involved), and according to whether a single slot or a cluster was involved.

The principles involved and the details of the procedures to be used to determine rent revisions would be published at least two years before a new lease was offered for sale. The revision terms would remain constant for the duration of the lease, which could only be terminated by the agency buying in the lease, or agreeing to its surrender under suitable terms.

B.6.10 Agreeing the Qualification of Bidders

Bidding for slots within any field would be restricted to that field's own set of qualified bidders.

In addition to the need to qualify under the CAA rules, certain potential bidders would be disqualified because it was judged that they were not genuine operators but were merely speculating in slots in the hope of selling on at a premium.

Certain bidders would be excluded from certain fields because they had not satisfied the authorities that they had the necessary financial and technical backing to start an appropriate service, within the time between the auction and the operational date. This delay could be extended by the potential new operator by his pre-selling short leases which he was not yet able to use. This would be discouraged and limited to, say, one extra season. After this the slot would be confiscated.

Certain bidders would be excluded because they already held their permitted proportion of slots in the specified field.

Other bidders would be excluded because the particular field was reserved for protected operator categories, for which they did not qualify.

Some bidders might be excluded from part of the market because they invoked their rights to slots under a bilateral agreement, which restricted competition against them. They would be restricted to a special Bilateral field.

B.6.11 The Conduct of the Auction

B.6.11.1 Sequence of Auction

The method of auction used and the order in which fields, and the slots within those fields, are auctioned will have an effect on the outcome. The objective is to ensure that the most desirable slots are cleared first, so that only surplus resources are applied to the marginal elements. It is also to provide the authorities with a view of the potential demand for slots in various fields. In this way the cost of this intervention in the market can be judged. Complete fields would not by necessity have to be auctioned at the same time or in sequence.

The preferred order of auction is likely to be:

a. High Rent Slots
b. Small New Entry (SNE) field
c. EC fields
d. Public Service field
e. Other fields

B.6.11.2 The Method of Bidding

Bidding will be by sealed bids. Bids can be for a positive or negative amount. The sealed bid method is to ensure that operators give due consideration to the price they can afford, having regard to their own financial circumstances. A negative bid indicates that the operator either considers that the rent is too high or that the service cannot be run on purely commercial grounds, but could make a contribution to a social budget allocation, which might be designed to maintain a socially desirable service. A negative bid (if accepted) would in effect put the slot into the public service arena but would ensure that the airport facility was fully utilised. It would be possible to then place the service, together with its slots, into the Public Service field but we would not expect this to be necessary.

B.6.11.3 The Acceptance of Qualified Bids

The highest bid wins but bidders will be able to submit qualified bids. They will be allowed to specify in what order bids should be accepted. If a certain bid succeeds, then other bids will automatically be withdrawn. This may appear complex but some study shows that it is well within the skills of allocating bodies. In this way the market will be cleared by the highest bidder but will not be influenced by short term shortages caused by airlines bidding beyond their needs. Operators will also be encouraged to concentrate their resources on their primary slots, without the threat that they will over-buy and have to get rid of the surplus by trading in the market. The effect of this method of bidding will also be to give the agency good information on the extent of demand across the market, without having the market become temporarily unstable as operators move to their secondary strategy, when their primary strategy comes under threat.

B.6.11.4 The Disqualification Rules

Bids may be rejected if acceptance would mean that the airline's allocation exceeded the allowed proportion of the field. Airlines would be allowed to state the order in which bids would be excluded in these circumstances.

B.6.11.5. Incumbent Matching the Highest Bid

As explained in section B8 on the sacrifice principle, the system whereby incumbents are forced to give up successive slices of their grandfather rights becomes more and more onerous as the transition period matures. From needing to protect new entrants from strong, mature operators, the requirement becomes one of protecting incumbents from having their business destroyed. This is achieved by the 'Core' rule which allows an incumbent to regain a progressively increasing proportion of the slots which he has had to sacrifice to each auction, by matching the highest bid.

This procedure will ensure that the lease is sold at realistic price, but, if he is prepared to pay this price, the ex-owner will retain what he considers to be a core asset. He would not have to declare these Core slots prior to the auction, so as to protect him from predatory behaviour from consortia of his competitors. He would merely have to enter a sealed bid which stated that the slot, or cluster, was a Core. The proportion of slots which he could declare as Core might increase from 20% of those sacrificed in the second year of the transition, to 80% in the sixth year. Core choice could be made conditional, depending on his success in the rest of the auction of the field.

B.6.11.6 Agency Intervention in the Market

The agency would exert powerful control over the market by being able to enter it at any time, if bidding was seen as unrealistic, or if it was clear that slots should be transferred from one field to another to a degree beyond the capabilities of the sacrifice system.

To exert this control however, the agency would have to pay for the privilege. This would make clear to everybody the price of implementing any part of the policy objectives. The exercise of power would then be in the public domain. The process could be registered with the various monopoly control authorities within the EC and the nations. This would add stability to the rules and further control the arbitrary power of the agency.

B.6.12 Post Auction Action by the Agency

The allocation process would involve a number of actions after all the bids had been received.

B.6.12.1. Decision on the Successful Bidders

As many of the bids would be conditional, and many would invoke a conditional Core clause, the determination of the successful candidate would be have to be conducted carefully and in an auditable manner.

B.6.12.2. Publication of Results

The results of each auction would be published in as much detail as practicable, bearing in mind the hundreds of thousands of slots which will make up the database at a busy airport. As many as 50,000 slots may be auctioned every six months. Clustering would greatly reduce this number, as explained in Chapter 4 of the main report.

As a minimum, the details published should include the winning prices and the total number of bids. It would be desirable also to publish the distribution of prices offered.

B.6.12.3. Maintenance of the Database

The maintenance of a database concerning the details and history of each slot and operator would be the responsibility of the allocation function. This would be a major task, but the development of some of the more advanced systems now being used could easily manage this.

In addition, models of the market demand for particular and generic types of slot will have to be maintained, so that the policy, allocation and coordinating functions can implement a logical set of actions in response to the market performance.

B.6.12.4. Setting Charges for Slots

Following the auction, which would reveal the market value of all the slots at an airport, the agency would have the task of setting rents for all slots, including those slots which were not in the auction. There are three classes of these.

a. Those slots within a field which had not yet entered the leasing field, being still held under grandfather rights.

b. Those slots in the field whose leases still had time to run, and which were due for rent reviews.

c. Those slots in fields excluded from the auction process, by, for instance, bilateral agreement.

EC regulations and the action of the OFT and the MMC in the UK, would demand that charges and rents should be non-discriminatory. It would be necessary to consider setting rents which certainly reflected the rents charged to those holding equivalent slots under leases. For b. (partial leases) it will be necessary to add a premium to these rents equal to the imputed rent of their capital value. This premium would be charged to both grandfathers and bilateral slot users. Both the concept of equivalence and this figure will be difficult to negotiate.

B.6.12.5 Feedback to Rental Levels

The charging system envisaged depends on the maintenance of some logical relationship between the market value of a lease and the rental attached to it. No modelling was called for during this stage of the study but initial indications from both the financial and industrial companies indicates that a 50/50 split between rent and the imputed capital values would provide the necessary damping to the system. Rents would be reviewed every 2 years, with one year's warning.

B.7 THE POST ALLOCATION TRADING ELEMENT

B.7.1 The Function of Trading

Trading in slots and clusters of slots has a number of functions:

a. It allows operators to match their requirements outside the confines of the seven year lease.

b. It allows the clearing of surplus slots, as they become available, thus increasing the efficiency of the airports.

c. It encourages operators to shed slots which they cannot use efficiently and realise money value from the surplus.

d. It provides a method of assessing the latent demand for particular slots within particular fields.

e. It allows an assessment of the relative penalties being applied by the differences in rules governing different fields.

f. It provides a mechanism other than sacrifice, whereby the authorities can influence the market by buying surplus slots and selling them as belonging to another field. This would be done where demand is seen to exceed supply, or where the policy objectives are not being met.

g. It provides a base, other than that provided by the allocation auctions, from which rent review criteria can be extracted.

B.7.2 The Role of the Agency in Trading

In this Market Option all trading is conducted by the agency by matching buyers and sellers. No trading is allowed outside the market and all trades are open for all qualified bidders. Trading in slots and clusters of slots would be allowed only within their established fields, as laid down by the agency. In this way the true value of slots within a field can be continually assessed. It also prevents incumbents favouring particular buyers. There are three types of trading, and these are outlined in principle before their detailed operation is discussed.

B.7.2.1 Long term Trading (Conducted by the Allocation Function)

This is a permanent transfer of a slot from one airline to another. This is normally achieved by the seller placing the slot in the six monthly auction.

B.7.2.2 Short Term Trading (Conducted by the Coordinating Function)

Slots which become surplus in the period prior to the next main auction (when a permanent long term trade would be made) can be short term traded. The sub-lease is valid up to the point where the slot is claimed by the ultimate purchaser six months after the next main auction.

Slots which are not needed for a short period could be sub-leased. This would allow the owner to avoid the confiscation rules. The period of sub-lease would be limited to, say, two seasons or, maybe, the last two years of a lease period. This would prevent undue speculation and the development of uncle and nephew relationships.

The coordinator would have to approve trades to ensure that they did not violate any of the airport capacity constraints.

Trading across fields would be permitted by the agency in certain circumstances, but the transfer profit would be taxed away so that the purchaser of the sub-lease paid the same price as his competitors had in the main auction. This would be a difficult calculation and may be resolved by the publication of standard transfer charges.

B.7.2.3 Same Day Trading (Conducted by the Coordinator)

Same day trading permits a market of sellers and buyers of any individual slots which are surplus at short notice. Trading would be permitted across fields but limits set on the number of times a slot could be sold before it was confiscated.

B.7.3 The Trading Sequence

As explained in previous paragraphs, slots may become surplus to requirements for a number of reasons. In general auctions of these slots will occur twice a year, at the same time as the agency is conducting its own auctions. The seller will be able to specify a reserve price. For slots which are placed on the short term market the agency will act as a broker. The seller will advertise a price which he wishes to obtain . Buyers will have registered the type of slot which interests them and the price they are willing to pay. The broker brings together willing buyers and willing sellers without revealing the names either to the market or one to another. This ensures that the market is protected from predatory behaviour when it is known that one airline is changing its strategy or is being forced to sell.

After the sale is completed the transfer, including the price paid, is registered and published. The agency would decide the timing and method of publication as a delay may be desirable. There is a need to provide the market with information, but there may also be the need to allow a sequence of transfers to take place if this is a part of the approved strategy of the agency.

Trading would take place in the whole of the remaining part of any lease. Purchase would carry with it the liability of paying the rent associated with the slot.

B.7.4 Trading of Very Short Leases

Special arrangement are made for trading in slots which may only be available on a particular day, or for a short period, prior to them being operated in the registered manner, within their authorised fields.

Same Day Trading would take place in a special market operated by the coordinating function. The aim of this would be to optimise the use of the airports slot capacity. The only inhibition would be the integration of that slot into the air traffic control and ground facilities capacity. It is unlikely that there would be a need to inhibit the use of same day slots by the rules applying to fields. There would be severe penalties on the registered holders of slots , if it was seen that they were using the same day market to hoard slots which they could not use, or if they were seen to be exploiting the cross-field transfer price mechanism.

The method of trading would be simple. A register would be kept of the slots needed by short term buyers and the price they would pay for them, together with the time by which the bid had to be satisfied, to give sufficient notice for the operation to be organised. Owners of surplus slots would register with the coordinating function as they occurred. Owners would be encouraged to sell their short term surplus as a source of revenue and as some protection against the severe sacrifice rules. The coordination function would have the power to a confiscate slot, having given due warning to the owner, if it became obvious that it was not going to be used. The owner could lodge an automatic instant appeal to override this threat of confiscation, by showing that he had attempted to trade the slots. There would be severe penalties if the slot was not then used by him.

B.7.5 The Rules of Trading

The rules of trading which would govern the activities described above would be simple.

a. All trading would be conducted by the agency.
b. All trading would be by the matching of bids and offers.
c. All trades would be registered and made public, including the price paid.
d. Trading would normally take place twice a year, when the balance of leases would be sold.
e. The part of the leases valid until the registered change of use, set six months after the next auction, would be sold to the highest bidder.
f. If the quantity of leases coming on the market justified it, the agency could run special 'out of phase' auctions to clear the market.
g. The agency could bid in the market at any time by matching the highest bid.
h. Very short term leases would be managed by the coordinating function.
i. Slots which were obviously not being used could be confiscated.

j. Slots could be confiscated if the same day and short term trading system was being abused for profit or counter to the previously published policy objectives.

B.7.6 The Feedback of Trading to Rent Setting.

Trading contributes the important information on the level of demand and the value being placed on individual slots. The prices paid for both long and short term slots would be fed back into the level of rents charged. If airlines were seen not to be giving up their unused slots in a logical manner, it could be concluded that the rents were not sufficiently high. If it was seen that there was little demand for surplus slots of a certain type within a particular field, it could be concluded that the current market conditions did not justify the particular rents being asked. Steps could be taken either to lower the rents at the next review, probably two years later for the agency, or to buy in the slot and transfer it to another field where demand was driving up prices to an unsatisfactory level.

B.8 THE SACRIFICE ELEMENT

B.8.1 The Function of Sacrifice

An element of sacrifice, to create a pool of slots for re-allocation, appears in most of the proposals for slot allocation options. It is probably the most controversial aspect of any option, as it affects the whole strategy of the incumbents and their approach to their businesses. The sacrifice element has therefore to be treated with the utmost care. It has to be studied in detail and its rules made as simple as possible in this option.

There are a number of essential functions which this element performs within the system. These are described below. In this description of the Market Hybrid, the term sacrifice is applied only to the administrative process by which an airline is required to give up slots so that they can be placed in a pool for subsequent re- allocation. These activities are a specified arm of agency policy. The, similar, confiscation action by the agency is applied as a penalty to those airlines who break the rules. The contribution that confiscated slots makes to redistribution is an unplanned enhancement to the pool creation process.

B.8.1.1 An Enabler of Policy

Sacrifice allows the agency to erode and prevent the creation of monopoly by any operator. Used in conjunction with the field concept, it allows the agency to fine tune the activity in every area of the market, as finely as the policy demands. In this option it is limited to the forcing of grandfathers to place slots on the open market. They are free to bid for them back.

B.8.1.2 Creation of a Pool

Sacrifice, together with the confiscation and the voluntary giving up of slots, is the way in which a pool of slots is built up. This allows allocations to be made to operators who would otherwise be excluded from starting or extending their operations, in a manner which will support the agency's policy. Without this pool, the ownership of slots would be restricted to either those who could afford to pay others to give them up, or to those who had inherited them during the phase when the grandfather rights to slots were being built into IATA procedures. This option aims to impose a uniform cost on every user of an equivalent slot from the start of the transition period.

B.8.1.3 Transition to the Lease Regime

In the case of this Money Hybrid option, the sacrifice procedure is the method of gradually forcing all the slots into the open market, while providing a controllable measure of protection for incumbents. The procedure will be difficult for these incumbents to adapt to but, with they and their rivals having to pay rents and imputed capital charges, it should be possible to provide them with enough protection to allow them to adapt their business strategies and practices over the period of the transition phase, which is expected to last some 5 years. They can choose which slots to purchase and, in deciding what price to bid, will be setting their future rents.

B.8.2 The Initial Sacrifice Rules

To create the initial pool of slots for re-allocation it is proposed that 20% of all the slots which an incumbent holds in any field should be candidates for sacrifice each season. Remembering that the objective is to both encourage new entrants and to move slots into the leasing market, the incumbents will be able to chose which slots to give up. It will be the responsibility of the agency to place these into fields and make them into viable clusters for new entrants. As the prime objective is not necessarily to raise the maximum rents and premiums, considerable latitude will be available in choosing the clustering. This is fully discussed in Chapters 4 and 5. The agency will have to have powers to modify the sacrifice rules within any field, if this is essential to make the re-allocation viable as an instrument of policy.

A review of the current usage of slots at Heathrow indicates that about 6% of slots are not used as planned and that others are lent to other operators on a semi-formal basis, to maintain the rights of the legal incumbent. Only about half of this 20% initial sacrifice will then, in fact, represent a real sacrifice for most of the current users. They will certainly lose some flexibility in planning their operations but the impact on their business in the first year is likely to be small.

B.8.3 Progressive Modification of Sacrifice Rules

To allow the sacrifice rules easily to be understood it is desirable that they remain constant. If this is done, then they will, at 20% a year, become more and more onerous as the transition years progress. In the final year the last slots which an airline is forced to sacrifice are likely to be at the core of its operation. Placing more and more these core slots or clusters under threat each year may destroy all the airlines currently operating out of congested airports.

To mitigate this effect, it is proposed that incumbent airlines will, after the first year of the transition, have the right to preview the results of the auction of the slots that they sacrificed in that round. He will then be able to declare a proportion of his sacrificed slots as Core Slots, an claim them back by matching the highest bid. The proportion of the slots which an incumbent can claim back each year will increase, so as to provide increased protection as the effect of sacrifice becomes more severe. There would be no Core bid in the first year. The Core bid in the second year would be 20% of the slots sacrificed in the second year. It would rise progressively to 80% in the fifth year.

Trading and careful selection by the incumbents could ensure that they were able to hold together their core route schedules, if they were able to pay the economic prices for their slots.

B.8.4 The Mechanics of Sacrifice

Because of the damaging effect that sacrifice can have on both established and new airlines, consideration has to be given to the details of the mechanics of sacrifice at the early stages of the construction of a slot option. This section provides some proposals, to illustrate typical procedures and the sensitivity of the system to small variations.

There will be special provisions for sacrificing from small clusters and fields but, in the initial stages, it will be fairly easy for established airlines to select candidates slots for sacrifice. These are likely to be slots that are not used, slots which will not affect the overall profitability of the operation, or slots which the airline considers far more valuable to it than to any rival, who would not bid. As the process of sacrifice takes its course, a number of anomalies will occur.

B.8.4.1 The New Entrant

An obvious anomaly will be that of the Small New Entrant. It is proposed to place such operations and operators in a Small New Entrant field which ensure that they are protected as they start operations. At some point they will be considered mature and be removed from this field, being expected to pay full rents and compete on the market for further leases.

It would not be sensible to require them to sacrifice their existing slots. This may cause them to re-enter the category of new entrant. That cycle might be stable but is ridiculous. Some rule must be developed to allow the successful transition from new entrant to mature operator, discoraging action by an airline intended to maintain its status of new entrant.

B.8.4.2 The Public Service

A further type of slot might be that allocated to Public Service. It is planned that these will be allocated to a dedicated field. It may be that these slots will not be sacrificed under a general rule but will be put to auction at specific times. The result of these auctions may be negative bids, indicating a level of subsidy needed to maintain the essential services. The agency rules may allow this to be paid out of the profits from sales, rents and trading.

B.8.5 The Appeals Process

The sacrifice element affects the operation of the allocation element, in that it enables the pool to be created from which the re-allocation can be made. For this reason the incumbents have to be informed as to the sacrifice which has to be made in the next round. During the transition period, the process requires that some airlines may be asked to sacrifice more that the base line rules demand, and as the agency has to prove that its actions are non-discriminatory, an appeals process will have to be set up.

The simplest arrangement would be for an aggrieved party to be paid the market price for the slots which were subject to this oversacrifice. Another would be for the agency to swap a slot as is now permitted under the current system.

There would have to be a differentiation between appeals against specific agency decisions and those of principle which would have to be referred to the policy function. Both arrangement would have to be legally constituted so that the quick operation of scheduling could not be disrupted by the Courts, the Monopolies and Mergers Commission, the Office of Fair Trading, or any of the EC monitoring organisations.

B.9 THE OPERATING CYCLE

This section provides the detail of the tension within each feature of the Market Hybrid slot option. Analysis of the system dynamics and policy compliance are in subsequent sections.

The Tension Analysis used in this section is based on a development of that produced in Stage One of the Study. The principles are described in Chapter 4 of this report.

The following is some indication as the importance of individual items to the viability of the whole system, as far as the tension analysis is concerned.

As with all the options, the objective when constructing this Market Hybrid is to produce as little deviation from the desired mode of operation as possible. This can be interpreted as giving some assurance that all the aspects of the option are being dealt with, by both the market and the administration, in a consistent manner.

In the case of this Market Hybrid option, the objective is to position all the various aspects of the tension analysis at around the mid point of the scale between being fully administrative and fully free market.

In Stage Two it has been discovered that a central assessment also implies that the administrative intervention should be limited to the upper level of the control structure. Every attempt has been made to avoid the need for detailed administrative interpretations at the working level. The policies are set at high level and the rules then applied. The resulting industrial response is then allowed to develop with only minor interference.

If it is discovered that some essential detail, needed to make the option operate satisfactorily, produces a movement far away from the centre then means are sought to introduce another feature with a compensating value. Ideally this should be very close to the deviant feature.

It should be remembered that the tension analysis is a tool and a check list. It is not a end in itself. The description given in this chapter of the background logic is a summary of an extended iterative process, between the tension analysis, the systems dynamic analysis, and the policy matrix. The last two are dealt with in subsequent sections.

The detailed description of the logic behind the tension analysis is laid out to allow subsequent modifications to be assessed for their effect on other interrelated parts of this Market Hybrid option.

B.9.1 Initial Allocation

This option is characterised by the medium term (7 year) lease of slots obtained through auctioning. The price reflects market value and some tightening of the effect is desirable. Some tightening is performed through the ring fencing of fields which restrict the allocation process in very well defined categories. This causes a shift towards more regulation, to the required value.

B.9.2 Post Allocation Trading Element

The leasing of slots is allowed in commercial terms in the free market at carriers' discretion but the agency is intervening throughout the definition of the fields. This results in a fairly free market.

B.9.3 Slot Sacrifice

B.9.3.1 Initial Sacrifice

The objective of this procedure is to create a viable pool of slots for new entrants. The proposed approach is to impose 20% of existing slots to be put for lease by the incumbent carriers in the first year. This harsh provision is then mitigated by the choice given to the airlines to select themselves the slots to be placed in the lease market.

B.9.3.2 Steady State Sacrifice

The very harsh sacrifice rules (20% a year) are kept in order to place all slots in the market in 5 years. Airlines can still choose the slots to be put in the market.

The resulting sacrifice provisions, assuming equal weights for the initial and recurring phases, are a highly interventionist element of the option. It is softened by allowing airlines to recover an increasing proportion of 'Core' slots at the bid price.

B.9.4 Slot Re-allocation (New Pool)

Restrictions apply to the leases airlines want to trade (term, field of use, etc). Market values apply, making this relax. It is partly mitigated by the restrictions within fields, a distinct limitation on free trading.

B.9.5 Traffic Allocation Rules

Existing TDRs prevail as of April 1991, which are harsh for excluded operators. These would be replaced by applying policy in the balancing of traffic between the chosen fields.

B.9.6 Airport Charges

As an example of a move towards a freer market, it is suggested that the BAA in London increase peak/off-peak airport charges as well as differential pricing between LHR and LGW to reflect more accurately market forces. Heathrow attracts more operators and users than some of the other London airports in the present infrastructure, interlining and economic environment. BAA should be allowed to track those trends better than today. This would move the current system from the present harsh environment to a more neutral position.

B.9.7 Slot Operational Mechanism

The working framework will be the Airport Scheduling Committee (ASC) with airline professionals under the agency, which will translate into operational reality the slots obtained through the market mechanisms, subject to the agency's policy on fields. This is a neutral operational translation of policies towards a slightly more free market than today's system (ASC/IATA), subject to IATA guidelines.

B.9.8 Priority Rules

The priority rules come with the slots, which is a reflection of market forces (auctions) and government intervention (fields). This is neutral. IATA rules and other preferences are discarded. The owner of the slot has priority for the assumed time window and will be accommodated as efficiently as possible, just like today.

B.9.9 'Use It or Lose It' Provisions

The 'use it or lose it' provisions are the FAA rules made stricter by imposing a 75% (as opposed to 65%) utilisation of the booked slot in a two-month period. As airlines are paying capital and rents for the slots, the 'use it or lose it' provisions are neutral. Public welfare and efficiency considerations nevertheless impose the need for a definite tightening of the rules compared to the present where slots are known to be maintained somewhat artificially to preserve historical rights.

B.9.10 New Entrant Status and Protection

Full protection is given to entrants once they are allowed in the slot allocation system through the small new entrant and public service fields. The tension created by the intervention in the market place to protect selected operators is unavoidable if the policy of providing fair opportunities of access is paramount.

B.9.11 Brokerage

By construction, this option is a hybrid of government intervention and free (monetary) market forces. The airlines initiate their own lease bids on the market place, subject to the intervention of the agency (acting as broker) buying on the market, when required for the application of policies, within the field structure. The process is neutral.

B.9.12 Transaction Frequency

Airlines can perform short term transactions at any time. The main auctions continue twice a year as do the present scheduling conferences. This is neutral.

B.9.13 Revenues

A significant amount of monopolists' (incumbents) rents is extracted but not to the full extent of the free market forces at play (due to the field limitations, the term limitations of the leases, and the partial increase of airport charges). This produces high tension in the system.

B.9.14 Market Tension Analysis Summary

The relatively low level of internal tension compared to the current system has been achieved by design. The aim is to minimise the conflicts between the respective elements of the option (sacrifice, initial allocation, post allocation trading, and re-allocation) and other characteristics (airport charges, operations, etc).

It is believed that this option has been optimised to produce its lowest practical level of internal tension for an option which includes money and fairly close control of the market. It is a large improvement compared to the existing system. The intervention of the government in a free market mechanism will always be accompanied by unavoidable stress in the market place. Some elements can be further tuned to match the policy objectives more closely. Some might already be beyond potential adjustments such as the TDRs which have recently been substantially relaxed. The internal tuning, in order to achieve the desired policy objectives, was accomplished through the definition of fields which, in the long run, will allow the dynamic adjustment in a more subtle and effective way.

B.10 SYSTEM DYNAMICS ANALYSIS

The Systems Dynamics Analysis (SDA) for this Market Hybrid option is summarised in Chapter 6. This section contains an explanation of the assessment. The SDA used is that developed in Stage One of the Study. The process is outlined in chapter 4.

The objective when constructing any slot option is to try to put in place features which will cause each of the sub-elements to be scored highly on the SDA matrix. This will ensure that the elements, and thus the whole system, are responsive to the market but are stable. The system is them more likely to be understandable to both the industry and the administration.

The final SDA assessment is in fact the result of an iterative process between the SDA, the tension analysis and the policy matrix. The last two are explained in other sections.

Considered as a three element system, the Market Hybrid can be made to work. The allocation element provides a balanced set of characteristics on its own. The sacrifice Element is unstable and very difficult to control. This lack of control can be recovered by the use of a very free trading element, which provides a great deal of market information, while at the same time allowing the agency to discipline any efforts to abuse the trading system.

Details of the individual elements are discussed below.

B.10.1 The Allocation Element

The scores in the allocation element are variable. The market and official reaction are unknown until tried. To account for this it must be assumed that there will be some instability in the application of the rules.

a. Predictability of Market Reaction

It will take some time for the market to understand the system of bidding for slots within fields. The significance of the auctions will increase as more 'Core' slots enter the market each year. The level of trading will increase, as airlines attempt to collect desirable slots or slots which they can sacrifice without pain. The selling of the remnants of leases may develop into tactics for reducing disruption to services, replacing crisis management with planning. Their success in doing so will affect the official reaction.

Airlines will have to set up special trading cells to match their bidding and trading to their resources and their aspirations. The quality of these may decide the survival of the airline. It is not certain that the smaller airlines will be successful in this phase. Some help may be needed.

b. Predictable Official Reaction

There is some experience of creating fields in the UK, but this has been achieved by the decree of the TDRs. Officials will have to learn to operate in a intense atmosphere, where individual pressure groups will be pressing for a whole range of fields to protect their own interests. There is a danger that the agency will not be able to develop a model of the market, to give it the assurance to project a steady face. Politicians may try to change the quantity and type of official allocations at short notice.

c. Quality of Information

The quality of information about the market will be good, within the constraints of the individual clusters and fields. With the agency having all the information contained in the sealed bids and the market having the information as to the prices paid, the predictions for the next auction should be based on sound data.

The early publication of details of the contents and rules for fields is vital to the exercise. To allow the allocation system to operate in a stable manner, all parties must be able to rely on the structure of fields and the size of the auction being both stable and predictable.

The other key feature in the allocation element is the fixing of the relationship of the rents to the prices realised for slots auctioned. Bidders for slots will be able to calculate the full costs of their actions for a period at least up to the next rent review. Incumbents will be the passive victims of this process. The rents of their current slots will be related to price of other slots in the market. It will be essential that the algorithm to be used by the agency is understood by the airlines, and that the actual rents to be charged, following the next rent review, are publicised well before airlines have to decide what slots to bid for, and what price to bid.

d. Speed of Market Response

The Market Hybrid system will respond very quickly to the allocation process proposed. Everyone will know the ownership of each slot and the price paid. Once the results of the auction are known, all the successful bidders have the security of long leases. They can enter the market and attempt to obtain short leases to allow them to start services at once. Alternatively they can, within the limits of the rules, delay the start of the new services by selling a small element of the lease.

Losers will have six months to make other arrangements and can enter the market at once to obtain extra relief. They will be able to adapt their strategy and tactics at once, and start planning for the next round of allocations.

e. Stability Under Fixed Rules

It will be possible for the agency to impose complete stability on the industry in terms of the mix of traffic using any congested airport. It will also be possible to impose a great deal of influence on the relative price of slots, by the fixing of rules for different fields. The agency will have only limited influence on the actual cost of a slot within a field, once the contents and rules have been set. Changing the relationship between the rents and the lease prices will only change the damping on the system but is unlikely to affect the average money extraction levels.

f. Stability of the Rules

At a high level, the rules on allocation are simple and stable. The stability of the details of such rules as those concerning the make up of fields, the relationship of rents to lease prices, and the rules which govern each field, will be critical to the satisfactory operation of the Market Hybrid. It is considered that, with strong management and nerve, this can be made stable.

B.10.2 The Trading Element

The Trading element of the Market Hybrid option is very powerful in providing all the systems features required. The only uncertainty is whether the agency will be able to stand back when it sees the industry exploiting the characteristics of the trading market.

a. Predictable Market Reaction

The trading rules are simple to understand in the Market Hybrid. All members of the market will be able to develop both long and short term strategies and be able to understand that being exercised by others.

b. Predictable Official Reaction

The record of official forecasting in the whole air transport industry is not good. It must be assumed that the actual outcome of trading in slots will not be as predicted by the agency. There is going to be a temptation for the agency to use its vast financial resources and its powers to buy into the market, to force the market to follow the agency model of the shape of the industry.

This will be restrained somewhat by the rule which demands that the agency publishes the price it has paid to extract slots from one field to place them in another.

The rule that all trading has to be through the agency will increase its confidence and make its actions more predictable.

c. Quality of Information

The agency acting as broker and publishing the results of all trades, with the ability to intervene, will ensure that the trading will show the real value of individual slots within an field and between fields. The inclusion of traded value in the calculations for rent review will add damping to the system, as will the 'use it or lose it' rules which will discourage speculation in scarce slots.

d. Speed of Market Response

Market response to trading will be rapid. The buyer can specify the date on which he wants the slot. The seller can specify the date when it will be available. Both will have to be flexible if they wish to have their demands met at a reasonable cost. The market and the agency will know the latent demand at any time, as bids and offers will be published in the market.

The very short lease market operated by the coordination function will provide a good forward gain on the trading system. The agency could use this as a preparation for its intervention tactics at future auctions.

e. Stability Under Fixed Rules

The system would be very stable under fixed trading rules. The financial power of the agency would overwhelm any airline which attempted to trade into a monopoly position. The finite life of each slot in use, and of the leases on slots, would discourage speculation. The market would allow the trading of slots for negative amounts. This would both dampen rent levels and allow the agency to buy in slots for re-allocation to other fields and clusters.

f. Stability of the Rules

Until the trading system has been in operation for some time it will be impossible to be certain that the rules will remain fixed. At the high level they are simple, but the reaction of a large trading market may be rather overpowering, particularly if airlines try to trade away from the sacrifice rules. There is bound to be a temptation for the agency to overcome some of the political problems with the sacrifice rules and fields, by modifying the details of trading. The judgement of the make-up of clusters will have a significant effect on how soon the trading element settles down with stable rules.

B.10.3 The Sacrifice Element

The Sacrifice element of the Market Hybrid is the most contentious. It has to be harsh on incumbents, to get all the slots into the free market in a reasonable time. It has to provide opportunities for small, new entrants and protection for them. The balance has to be changed as the transition to the free market progresses.

The characteristics of sacrifice, as far as the system engineering is concerned, are fairly poor. The lack of information it provides and the poor stability under fixed rules, can only be compensated for by very careful drafting of detailed rules which are flexible enough to remain fixed. There is likely to be a great deal of administrative negotiation over the details of sacrifice.

a. Predictable Market Reaction

There are a number of ways which the industry could respond to the sacrifice regime proposed for the Market Hybrid. They could trade out of the sacrifice zones, operate in such a way as to invite a particular sacrifice, or they could seek to frustrate the objectives of sacrifice by declaring non key slots as 'Core' and buying them back to frustrate rivals.

b. Predictable Official Reaction

The sacrifice rules are simple, but the modifications needed to allow the agency the flexibility to construct clusters and fields, is likely to demand a great deal of skill, if a whole plethora of disputes and petty regulations are to be avoided.

The proposed methods of gradually withdrawing support for new entrants while increasing protection for incumbents, as the transition progresses, is an attempt to give the agency a firm framework in which to work. Sacrifice is fundamentally an administrative process; stability in a free market will be difficult for the agency to achieve.

c. Quality of Information

Sacrifice will only reveal information on the details of official policy and the official view of the state of the market. Information on the industry will only be obtained second hand, by watching reactions to sacrifice. This is likely to be a subjective assessment. Allowing incumbents the absolute right rather than the first say in what they will sacrifice first would add greatly to the information in the market, but it may not be commercially acceptable to do so.

d. Speed of Market Response

The market will respond quickly to sacrifice, but the delay on implementation of nearly a year between the announcement and the implementation will slow the process. Trading will allow airlines to reduce the effect. The clever ones will be able to orchestrate the termination schedule of their portfolio of leases to reduce the impact on their businesses.

e. Stability Under Fixed Rules

The sacrifice system would result in the disintegration of the industry if the rules were not adapted as proposed to both the market conditions and also to the progress of the transition towards the freer market. The recovery of 'core' slots is key to stabilising the sacrifice element.

f. Stability of the Rules

Some simple adaptions to the sacrifice rules would stabilise the Market Hybrid system. The agency would have to be free to apply full administrative powers if the situation got out of hand. The temptation for political interference would be very great.

B.11 POLICY OBJECTIVE ANALYSIS

The Market Hybrid option has been assessed against a policy convergence matrix, which has been refined from that developed during Stage One of the Study. The concept of the policy matrix is explained in Chapter 4. The grading of the 22 policy features was endorsed by the Department of Transport as a basic assumption for Stage 2 of the Study.

The Market Hybrid option has been developed as a result of an iterative process involving the policy, tension and systems analysis. The last two are explained in previous Sections. This shows an assessment of the level of support which this Market Hybrid gives to each particular policy feature. It is be possible to see the effect of introducing additional features on this particular Market Hybrid option.

Of the 22 Policy Aspects considered below, ten show a significant divergence from the official priorities. All except two show that the option potentially allows a greater measure of support in a number of areas than is thought necessary.

This leads to the conclusion that the Market Hybrid has had to put in place mechanisms to control and balance the free market which are more powerful than are strictly necessary. These powers will have to be strictly controlled if the temptation to interfere with the market is to be resisted.

This feature emphasises the need to ensure that all the information generated by the market, and the detail of the operation of the agency, is available to all. This will not only provide a basis for airlines to plan, it will also be a check on the authorities.

One policy aspect which is not supported by the option as envisaged is that of user costs. This is because it is a study assumption that the agency revenues will be taxed away. The study does not contain any economic model which will allow us to judge if the increased efficiency, which will be produced by increased competition, will compensate for this taxation. The total tax may amount to 10% of long haul fares and the doubling of very short haul fares. This is explained in Chapter 11. This could be mitigated by the construction of suitable short haul fields.

The other aspect not supported is the requirement to provide balance between national carriers. It is not thought to be practicable to have a number of national carrier fields.

B.11.1 Commercial Aspects

1a. Interests Outside the EC

The option allows for the construction of fields which would make possible the protection of a single or general commercial interest outside the EC, although this would be balanced against all other interests.

1b. Interests of the EC

The proposal to construct specific EC and non-EC fields would give the EC the mechanism to apply its own rules to each, thus protecting its own interests. Money will be generated from the EC congested airports which may contribute to the EC infrastructure funds.

1c. Interests of the UK

It would be difficult to protect UK interests specifically. The Short Haul fields would protect some to the UK airlines, but it is not proposed to differentiate between EC operators. Fields are proposed to exclude subsidised airlines. Large sums of money would accrue to the UK Treasury. The money extracted from the system may make the UK and other EC congested airports expensive centres to travel to, compared with other EC destinations. To balance this, a wider range of international operators will have access to the UK congested airports, making them even more attractive and the slots more valuable.

1d. Interests of Airlines

While no specific airline is favoured, and the incumbents will suffer severe turbulence during the transition to the free market, the option does offer a structured route to allowing efficient airlines, operating popular services, to prosper. The field system should allow niche airlines to offer Public Service routes, supported by the agency.

The Market Hybrid option offers protection against the abuse of the leasing and trading procedures and will allow the agency to prevent the expansion of those airlines which threaten to build up a monopoly position in any part of the market.

1e. Interests of User Groups

Being a Market Hybrid, the option will extract a considerable amount of money from the airlines for the use of congested slots. It will be necessary to run an economic model before it is possible to postulate the effect on efficiency within the industry, brought about by the need to compete for scarce slots on the open market.

The immediate effect on short haul operations without a short haul field could be to double fares. The effect on long haul is less easy to predict. It is expected that fares will drop considerably as the market opens up. Profit margins will fall on long haul. This will reduce the money available to subsidise the unprofitable short haul operations. However, long haul airlines may be forced to patronise short haul to gain interline traffic, to increase the load factors on their marginal long haul operations.

Many short haul routes will become uneconomic, if forced to operate in the free market. Placing them in a short haul field will restrict the competition to that from other short haul operations. Those which the agency deems socially desirable can be protected within their own special field.

In general the option is neutral towards users. The use of the administrative process will allow the distribution of slots to be moderated from that which the free market would decide, towards that which the policy objectives are judged to demand.

B.11.2. Operational Aspects

2a. Efficiency of Airports

The option would encourage airlines to use large aircraft and carry as many passengers and as much cargo in each as possible, to defray the fixed costs of the slot. The field system would remove some of the pressure from special types of operation, but there would still be competition within these fields. There would be severe commercial and confiscation penalties for not using slots, and the trading system is designed to encourage the selling of surplus capacity, be it long, medium or short term.

2b. Efficiency of Slots

The option would, above all, have the effect of maximising the use of slots. Each one would have a value, which would be published in the market and subject to regular revaluation. The agency has the power to attach negative rents (subsidy) to any slots it wishes to support. It can also subsidise services which will utilise unpopular slots, by constructing suitable fields.

2c. Efficiency of Aircraft

The option would not specifically encourage the efficient use of aircraft. The slots and the clusters available to an airline might not be perfectly suited to the particular operation which it wanted to run. The agency could do no more than construct a range of cluster types, and let the market bid for them. The agency may have misjudged the demand.

Trading will allow airlines to build clusters to meet their needs. As the incumbent's groupings of slots are destroyed by the progressive sacrifice process, more and more slots will be entering the trading market. This will make the construction of clusters to optimise the efficient use of aircraft easier to achieve.

The restricted period of the lease (7 years proposed) will make the construction to clusters an ever present concern to the airlines. This will cause an instability in their individual drive for efficiency.

B.11.3 Use Of Facilities

3a. Balance of International Carriers and Routes

The option will allow virtually complete control of the balance between international carriers and the routes they operate. The agency can decide the number and nature of their fields. The option proposes the minimum control of these fields, and bilateral operators and those being subsidised will be excluded from the general market. In general the simple operation of the rules should allow the agency to maintain the balance as required.

3b. Balance between EC Carriers

It would be most desirable if there is only one EC field, there can then be no bias or balance between EC carriers. It might be possible to create a special field for those that fully met the competition criteria, and exclude the rest. This option assumes that all EC carriers will be free to compete for slots at congested EC airports. Policy decided that ther must be a field for EC Long Haul to divide the EC market.

3c. Balance between National Carriers

It may be possible to bias some of the Public Service fields towards groups of carriers from a particular nation, but in general, the field system proposed will reveal any bias and make this difficult. The rules would allow any qualified airline to bid for subsidised services.

3d. Operating Group Balance

The control of the balance between operation groups, however these are defined, is only limited by the number of fields the agency is prepared to operate. In this option it is proposed that these be restricted of some 6 in number, as described in Paragraph 5.1.3. Balance would then be kept under quite strict control, to moderate the market forces and ensure that undue advantage could not be taken of the scarcity of slots; neither by those operating within the free market, nor by those insulated from it by regulation, financial power gained outside the industry, or bilateral protection.

B.11.4 User Aspects

4a. User Costs

With the assumption that all the income derived from the leasing, renting and the trading of slots will be taxed away, the effect on the costs to the users of bringing in a Market Hybrid depends on assumptions made as to the gains in efficiency, which competition for slots will bring to the airline industry. This is outside the scope to the present phase of the Study.

If no efficiency gains are made, the calculations in Stage One indicated that long haul fares would increase by about 10% and Short Haul fares would increase significantly, if special short haul fields are not constructed.

The long haul assumption is clearly pessimistic because the profit margins are currently high. Fares will be cut as competition increases. The low margins and the high level of cross subsidy of many current short haul operations mean that the effective trebling of landing costs can only be balanced by large decreases in other operation costs. The imposition of these slot costs may accelerate economies in other areas, but this is far from certain.

The use of the specific short haul field will be essential if short haul users are not to suffer large fare increases. Of course, large fare increases would drive non - essential short haul traffic away from congested airports and thus reduce the shortage and scarcity value of slots to other users.

4b. User Choice

The implementation of the Market option will progressively erode the position of the grandfather airlines and attract those which feel that they can make profits by providing alternative services. There may be some erosion of user choice on thin routes, if some operators are presently using cross-subsidy from long haul to maintain the service. The judicious use of fields would allow the agency to maintain routes it feels are essential from the user choice point of view.

4c. User Convenience

There is evidence that as competition increases, airlines are less likely to support transferable tickets and encourage cross bookings. Specific measures will have to be taken to prevent monopolies of travel agents being created by powerful airlines.

Balancing this, the environment may be so severe in some areas that airlines will be forced into allowing customers flexibility, in order to attract them to a premium service in the first place. The basic low cost market is likely to become more rigid, rather in the manner of the current charter market today. Even the latter is showing considerable flexibility at the margins, in the battle to sell surplus short term capacity at any price.

B.11.5 Control Of Monopoly

5a. Airports Monopoly

The control of any tendency of any congested airport to exploit its monopoly would be absolute. The agency would be able to set rents at a level which drove traffic away, unless the airport moderated its landing charges. It would also be able to control any moves by the airport to replace one category of traffic with another so as to generate a greater income per slot for the airport.

As the agency income is taxed away, the effect of the Market Hybrid option will be to make congested airports expensive to airlines in real cash terms. This will enhance the attractiveness of other airports, both in the host country and in neighbouring States.

5b. Airline Monopoly

The airlines would find it very difficult to exploit their monopoly in any part of the market. The fields for small new entrants would give rivals a chance to set up on thick routes. The established airlines could be excluded from operating in Public Service (and subsidised) fields. The incumbents would be forced to compete in every part of their market, with all qualified bidders, for more and more of their Core slots. As an airline became larger, the cost of defending all its slots and clusters against all comers would become more expensive, as rivals concentrated all their efforts on the premium routes.

Although the airlines would be able to capitalise the value of the slot leases, this would increase their capital employed and reduce their rate of return on capital. The slot rents, being tied to capital value, would contribute to costs in some relation to these capital values. Airlines trying to defend a wide range of premium slots would suffer double capital and annual cost taxation.

B.11.6 Control of Cross Subsidy

6a. Subsidy Between Airports

As the Market Hybrid allows the agency to set rents at congested airports in competition to landing charges, and these rents are to be taxed away, there is little scope for airport groups to transfer high landing fee profits from one airport to another, if policy branches decided that the agency mechanisms are to be used to prevent this. It may be necessary for the OFT and the MMC to control the transfer of concessionaire rents between airports.

6b. Subsidy Between Routes

While there is nothing in the mechanisms proposed in the Market Hybrid which would penalise the subsidy of one route by another, it will be difficult to do because of the competition within each field, which should keep down the profits of all within the field. If profits were seen to be excessive in one field, the size, nature or the number of airlines qualified to bid could be increased. If airlines are seen to be transferring funds to exploit, say, the definition of Small New Entrants, to operate at low slot cost against a rival, it would be possible to create rules which were very specific over the definition of an independent airline.

6c. Subsidy Between User Categories

Freeing competition on the premium routes will lower the profits from this traffic. It will become difficult for airlines to subsidise across categories. The premium and rents will fall as a Poll Tax on all passenger seats. The effect on the lower fare passenger will be proportionately greater that the high payers. The effect of this on the attraction of cross subsidy as a business strategy has not been modelled at this stage of the study.

B.11.7 Generation and Use of Proceeds

7a. Source of Funds

The Market Hybrid makes transparent the source of funds raised from slots. Also transparent is effect of the control which the agency is exerting on the market. The size and nature of each field will control the market value of each of its slots. These can be compared to comparably timed slots in other fields. The cost of official intervention can be seen by all, and will have to be justified.

7b. Use of Funds

The Terms of Reference imposed on Stage Two of the Study by the Department of Transport assumed that the surplus generated by the agency would be taxed away by the Exchequer. There is no ambiguity in the flow of funds in this scenario.

B.12 REVIEW OF THE MARKET HYBRID OPTION

This monetary option has been constructed to exploit the advantages of using money to allow the market to decide the value of a slot to various potential users, while providing the authorities with the necessary mechanisms to ensure that the policy objectives are met, including the objective of preventing the abuse of money to build up monopoly within the system.

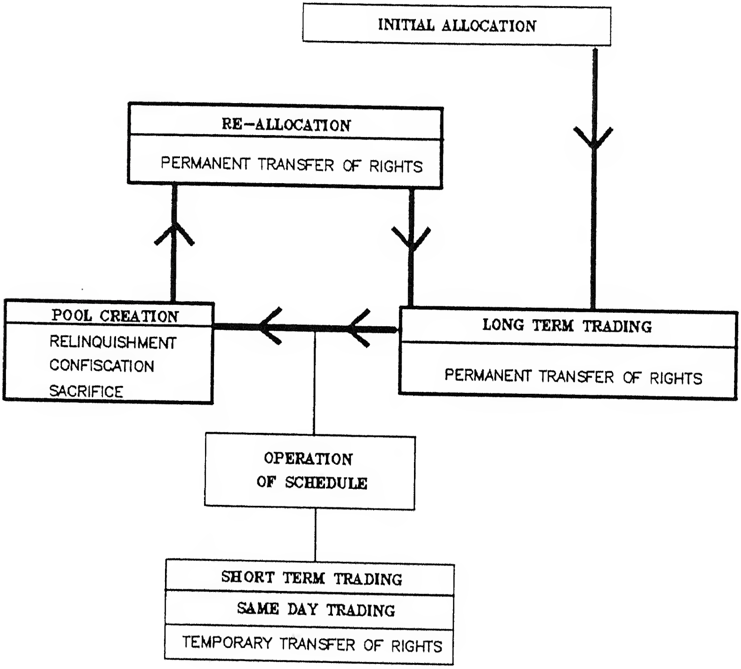
As is described in this annex, it can be seen that, to achieve this aim, the agency has had to be vested with significant powers. It decides on the size and composition of fields, the rules of operation, and candidate bidders for the auction. It sets the rules for trading and acts as sole broker. It applies the sacrifice and confiscation rules, and it sets the rents inside the EC fields and equivalent rents in the bilateral fields.

All these mechanisms are put in place to ensure that both the market and the authorities have enough information to make the system work. The sub-rules described may not be complete but they show the type of principles which have to be followed to ensure that rules are formed which are easy to understand and straightforward to apply.

With all this power in the hands of the agency, it is necessary to enforce discipline on the authorities. The key to this discipline is the clear differentiation between the responsibilities of the three functional levels, the open publication of most of the rules and the results of the auction and trading, and the principle of deciding the allocation, within the discipline of the fields, by auctioning to the highest bidder.

All these measures are designed to make the effect of official intervention in the market obvious to all. The agency will have to justify all its decisions. The difference in prices between fields will be seen. The effect of rents will be seen. The cost of Public Service will be obvious.

FIGURE 4.1 FUNDAMENTAL MECHANISMS OF SLOT ALLOCATION SYSTEMS



- ONCE THE SYSTEM IS ESTABLISHED IN THE LOOP IT BECOMES A CONTINUOUS PROCESS

- AS THE ENVIRONMENT CHANGES IT IS NECESSARY TO ADAPT THE RULES OF EACH OF THE ELEMENTS

FIGURE 4.2 TYPICAL MANAGEMENT STRUCTURE OF THE ALLOCATION SYSTEM – BOTH OPTIONS

FUNCTIONS AND RELATIONSHIPS

[ ]=MARKET HYBRID

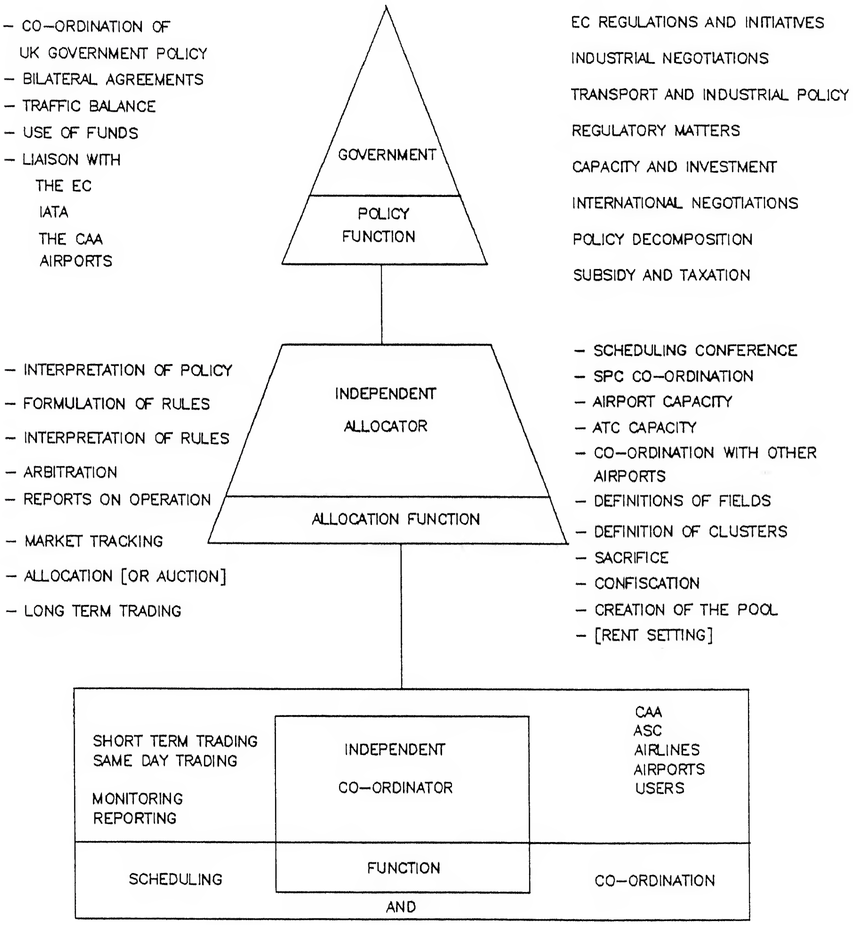
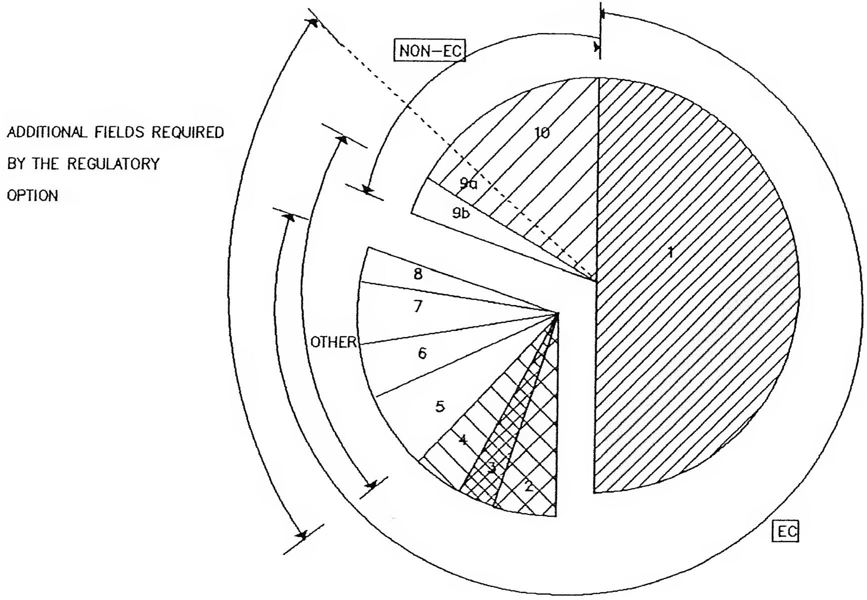


FIGURE 5.1 TYPICAL ALLOCATION TO FIELDS



	Regul.	Mkt.	
1. SHORT HAUL	✓	✓	
2. LONG HAUL	✓	✓	
3. PUBLIC	✓	✓	
4. SMALL NEW ENTRANT	✓	✓	
5. LARGE NEW ENTRANT	✓		OTHER
6. MANAGEMENT	✓		
7. CARGO	✓		
8. GA & BUS	✓		
9. FOREIGN GENERAL	✓		
10. BILATERAL	✓	✓	

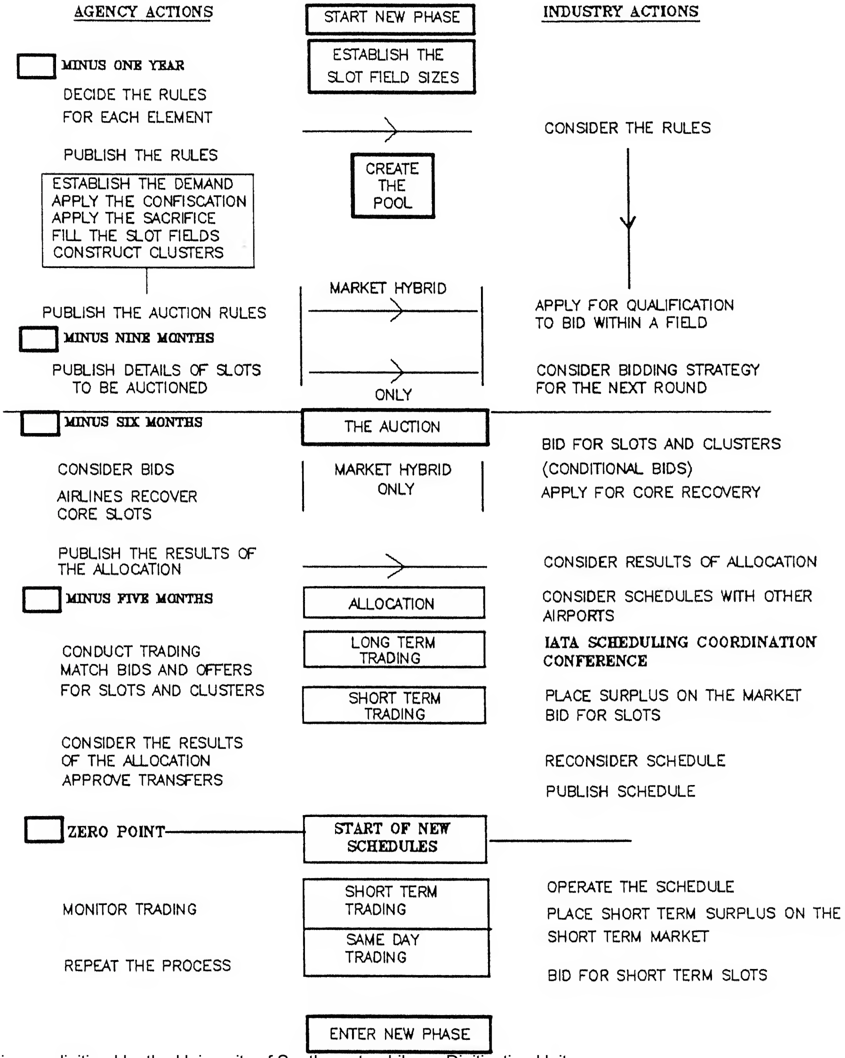
NB.

9a. Part of Foreign General Field, in transition to a Bilateral

9b. Part of Foreign General Field, in transaction to an EC field.

Note: Field sizes are for illustrative purposes only.

FIGURE 6.1 SEQUENCE OF OPERATION OF SLOT ALLOCATION



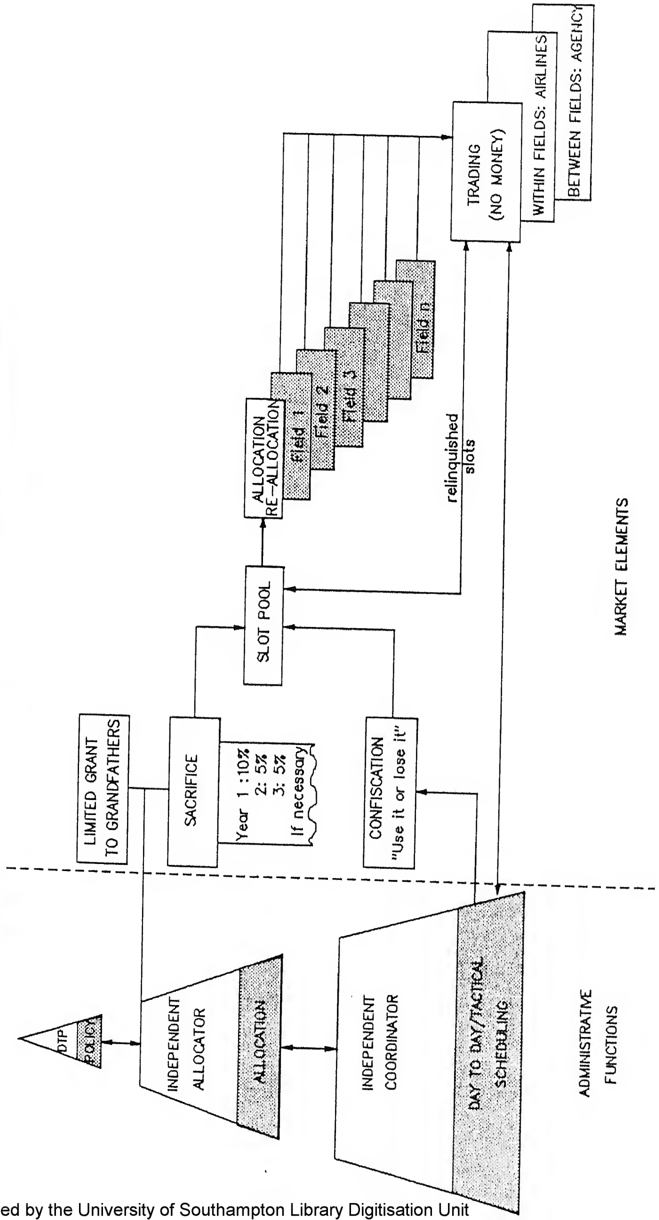
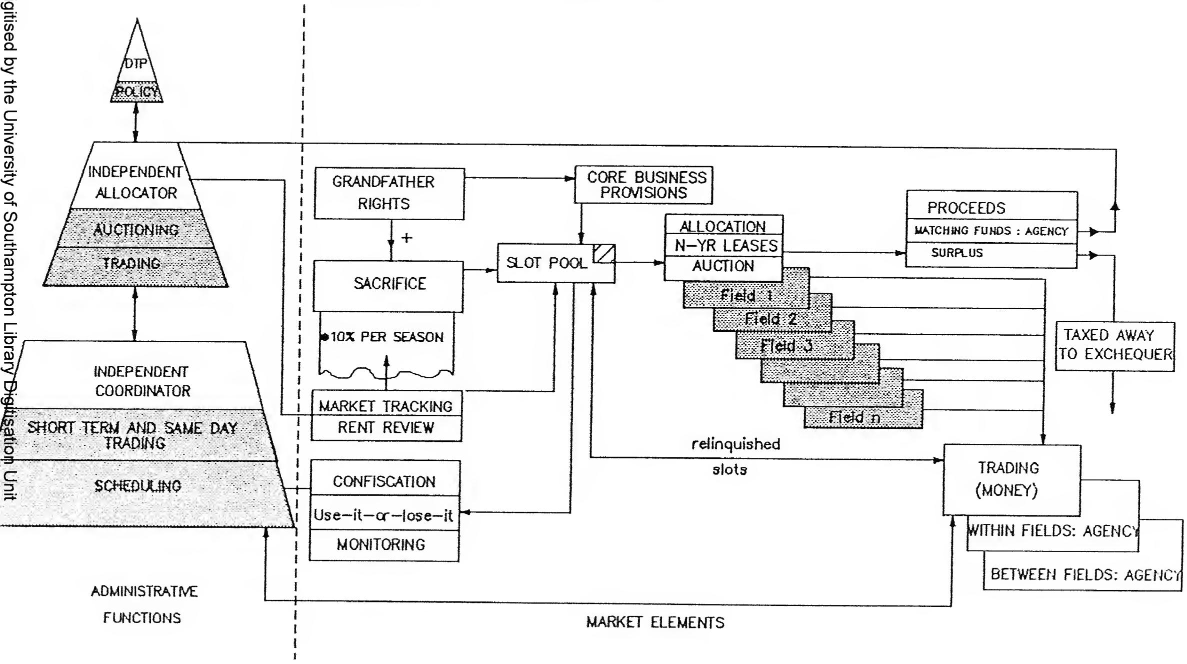


Figure 6.2 REGULATORY OPTION-OVERALL OPERATION MECHANISMS

Figure 6.3 MARKET HYBRID OPTION–OVERALL MARKET MECHANISMS



ANNEX C

FIELDS

ANNEX C1 : FIELD DECOMPOSITION

ANNEX C2 : PRACTICAL FIELDS IDENTIFIED

ANNEX C1

FIELD DECOMPOSITION

FIELD DECOMPOSITION

C.1.1 INTRODUCTION

There are a wide variety of groupings which can be used to describe civil air operations. Different groupings are used for different purposes.

In Stage Two of the slot allocation study it is necessary to investigate a range of groupings which will allow the various elements of the system to operate efficiently, while at the same time enabling the policy objectives to be achieved. These chosen groupings have been termed fields for the purpose of the study.

This Annex contains a decomposition of the groupings by which the use of slots may be described, under a number of headings and sub-headings. The contents of each group are not, of course, mutually exclusive. By definition, any full decomposition which starts at the same level may lead to the identification of all the elemental parts, from whatever point the decomposition was initiated. Starting from many points allows the bottom of the decomposition to be reached quickly and with the minimum of reconstruction of the higher levels.

The aim of this work is to provide the basic information and a check list of those fields which might be useful during the construction of the two slot allocation system developed in Stage Two of the study. A list of practicable fields is at Annex C-2 Figure 1. Annex C2 contains the definitions of these and Chapter 5 of the main paper explains the uses of fields within slot allocation systems.

C.1.2 THE DECOMPOSITION OF SLOT USAGE

Slots may be identified under the following ownership headings:

1. BY THE NATIONALITY OF THE OPERATING AIRLINE

a) UK NATIONAL
  1) SUBSIDISED
  2) INDEPENDENT

b) EEC NATIONAL
  1) NATIONALISED
  2) SUBSIDISED
  3) SPONSORED
  4) INDEPENDENT

c) BILATERAL GROUP
  1) RELATED TO THE UK
  2) RELATED TO THE EEC
  3) RELATED TO ANOTHER BILATERAL

d) BILATERAL INDIVIDUAL
  1) NATIONALISED
  2) SUBSIDISED
  3) SPONSORED
  4) INDEPENDENT

2. BY TYPE OF ROUTE SUPPORTED BY THE USE OF THE SLOT

a) BY DISTANCE
  1) SHORT HAUL
  2) MEDIUM HAUL
  3) LONG HAUL

b) BY DESTINATION
  1) DOMESTIC UK-POINT TO POINT
    a> SHORT RANGE
    b> MEDIUM RANGE-MAINLAND
    c> LONG RANGE-MAINLAND
    d> REMOTE-MAINLAND
    e> REMOTE-OVERWATER

  2) DOMESTIC NETWORK
  3) INTER EEC
    a> POINT TO POINT
      1> UK-EEC
      2> EEC-EEC

            - b> NETWORK INTER-EEC
            - c> NETWORK NON-EEC
                - 1> TERMINATING WITHIN EEC
                - 2> STARTING WITHIN EEC
                - 3> TRANSITING EEC
                    - a: SINGLE EEC SECTOR
                    - b: MULTI EEC SECTOR
        - c) BY FREQUENCY DEMAND WITHIN GIVEN PERIOD

3. BY THE QUALITY OF THE SERVICE FREQUENCY

- a) FREQUENCY
- b) TIMING
    - 1) AT CONGESTED SLOT TIME
    - 2) AT CONGESTED AIRPORT
    - 3) ON CONGESTED AIR ROUTE

- c) FARE STRUCTURE
    - 1) MIX
    - 2) HIGHEST
    - 3) LOWEST

4. BY THE LEVEL OF OFFICIAL SUPPORT

- a) SUBSIDISED
    - 1) OVERT
    - 2) COVERT
    - 3) DIRECT
    - 4) INTERACT

- b) TAXED
    - 1) DIRECT
    - 2) INDIRECT
    - 3) BY DESIGN
    - 4) BY COINCIDENCE

- c) NEUTRAL
- d) ADMINISTRATIVE SUPPORT

- 1) TO THE AIRLINE
- 2) TO THE ROUTE
- 3) TO THE SERVICE
  - a> ECONOMY FARES
  - b> SPECIAL CARGO
  - c> EMERGENCY SERVICES
- 4) AGAINST THE COMPETITION
  - a> BY REGULATION
  - b> BY TAXATION

5. BY TYPE OF AIRCRAFT CONTENTS

- a) PASSENGER
  - 1) SCHEDULED
  - 2) CHARTER
- b) CARGO
  - 1) ROUTINE
  - 2) HIGH PRIORITY
- c) LEISURE
- d) ENGINEERING AND TRAINING

6. BY TYPE OF OPERATOR

- a) SCHEDULED PASSENGER
- b) CHARTER PASSENGER
- c) SCHEDULED CARGO
- d) CHARTER CARGO
- e) CORPORATE PASSENGER
- f) MILITARY
- g) LEISURE FLYING
- h) MIXED OPERATIONS
  - 1) OF PARTICULAR MIXES
  - 2) OF ALL MIXES
  - 3) EXCLUDING CERTAIN COMBINATIONS

7. BY TYPE OPERATIONAL INTEGRATION

- a) POSITION WITHIN A FREQUENT SCHEDULE

- b) POSITION WITHIN A FREQUENT SCHEDULE
- c) MEMBER OF A MARKETABLE CLUSTER OF SLOTS
- d) INTEGRATED WITH OTHER AIR SYSTEMS
  - 1) ASSOCIATED AIRLINES IN THE SAME GROUP
  - 2) FORMAL AGREEMENTS
    - a> WITH AIRLINES
    - b> WITH AIRLINE ASSOCIATIONS
    - c> WITH USER ASSOCIATIONS
      - 1> TRAVEL AGENTS
      - 2> CARGO FORWARDERS
      - 3> OFFICAL CONTRACTIN AGENCY
    - d> WITH INDIVIDUAL AIRPORTS
    - e> WITH AIRPORT GROUPS
    - f> WITH REGULATORY BODIES
      - 1> IN CONFORMANCE WITH ENVIRONMENTAL CONSTRAINTS
      - 2> UNDER TERMS OF OPERATION LICENCE
- e) INTEGRATED WITH OTHER LAND SYSTEMS
  - 1) BY CROSS-OWNERSHIP
  - 2) BY AGREEMENT
  - 3) BY OFFICIAL DICTAT
- f) INTEGRATED WITH OTHER SEA SYSTEMS
  - 1) BY CROSS-OWNERSHIP
  - 2) BY AGREEMENT
  - 3) BY OFFICIAL DICTAT

8. BY AIRLINE HISTORY

- a) CURRENT NATIONAL SPONSORED CARRIER
- b) RECENT NATIONAL SPONSORED CARRIER
- c) PREFERRED CARRIER
  - 1) NATIONAL
  - 2) INTERNATIONAL
  - 3) BILATERAL
- d) MATURE IN THE MARKET SECTOR
- e) NEW ENTRANT
  - 1) TO THE COUNTRY

- 2) TO THE MARKET SECTOR
- 3) TO THE ROUTE
- 4) TO THE SERVICE

9. BY HISTORICAL USAGE OF SLOTS

- a) SERVICE PROVIDED
- b) ROUTES SERVED
- c) LOAD FACTOR
  - 1) CURRENT
  - 2) TREND
  - 3) PREDICTED

10. BY POLICY REQUIREMENTS

- a) ROUTE SERVICE DEMAND
  - 1) QUANTITY
  - 2) FREQUENCY
  - 3) TIMING
  - 4) TYPE OF SERVICE

- b) ROUTE SERVICE LEVEL
  - 1) UNDER SERVED
  - 2) PROTECTED
  - 3) BALANCED
  - 4) OVER SERVICED
  - 5) MONOPOLISED
  - 6) IN A PARTICULAR PRIORITY ORDER

- c) FINANCIAL INTERVENTION PUBLIC SERVICES
  - 1) COST
    - a> SUBSIDY
      - 1> OVERT
      - 2> COVERT
    - b> TAX
      - 1> DIRECT
      - 2> INDIRECT
      - 3> AS POLICY

4> BY COINCIDENCE

d) AIRLINE TYPE BY SIZE
- 1) SMALL AIRLINES
  - a> START UP
    - 1> SECONDARY EFFECTS
  - b> PROTECTED
  - c> NEW ENTRANT
    - 1> TO SERVICE
    - 2> TO ROUTE
    - 3> TO MARKET SEGMENT
  - d> MATURE
    - 1> EXPANDING
      - a: SECONDARY EFFECT
    - 2> STABLE
    - 3> CONTRACTING
      - a: SECONDARY EFFECTS
  - e> UNSTABLE
    - 1> EXPANDING
    - 2> CONTRACTING
  - f> MONOPOLIST
    - 1> ON SERVICE
    - 2> ON ROUTE
    - 3> IN MARKET SEGMENT
    - 4> IN NATIONAL AREA
- 2) LARGE AIRLINES
  - a> NEW ENTRANT TO SERVICE
  - b> NEW ENTRANT TO ROUTE
  - c> NEW ENTRANT TO MARKET SECTOR
  - d> NEW ENTRANT TO MARKET
  - e> MATURE
    - 1> EXPANDING
    - 2> STABLE
    - 3> CONTRACTING
  - f> MONOPOLIST

e) AIRLINE TYPE BY STRENGTH

1) ABSOLUTE VALUES OF
    - a> EMPLOYEES
    - b> FLEET SIZE
    - c> REVENUE PASSENGER MILES
    - d> REVENUE TON MILES

2) MARKET SHARE
    - a> WHOLE MARKET
    - b> MARKET IN WHICH INVOLVED
    - c> PARTICULAR MARKET SEGMENT
    - d> ROUTE

3) FINANCIAL STRENGTH
    - a> CAPITALISATION
        - 1> LEGAL
        - 2> MARKET ASSESSMENT
    - b> FINANCIAL RESOURCES
        - 1> ACCORDING TO CAA PARAMETERS
        - 2> EQUITY
        - 3> BALANCE SHEET DEBT
        - 4> OFF BALANCE SHEET DEBT
        - 5> ASSETS
            - a: PHYSICAL
            - b: GOODWILL
    - c> PROFIT
        - 1> ABSOLUTE
        - 2> TRENDS
    - d> CASH FLOW

4) OPERATING EFFICIENCY
    - a> PRODUCTIVITY
    - b> USE OF ASSETS

5) BUSINESS POSITIONING

6) GEOGRAPHIC POSITIONING
    - a> PHYSICAL LOCATION OF ASSETS
    - b> LEGAL POSITIONING
        - 1> COMPANY LEGAL STRUCTURE
        - 2> LEGAL ENVIRONMENT
        - 3> REGULATORY REGIME

7) FITNESS BASED ON EXPERIENCE
    - a> OF THE SERVICE

b> ON THE ROUTE
c> WITHIN MARKET SEGMENT
d> SAFETY RECORD
e> TYPE OF OPERATING LICENCE
f> NATURE OF OFFICIAL MONITORING
REGIME
8) EQUIPMENT STATUS
a> SIZE
b> SPECIFICATION
c> AGE

f) AIRCRAFT CHARACTERISTICS
1) AIRCRAFT SIZE
a> PHYSICAL
b> PASSENGER CAPACITY
2) AIRCRAFT NOISE GENERATED
a> TAKEOFF
b> LANDING
3) APPLICABILITY TO THE TASK

11. EQUAL OPPORTUNITY BALANCING

a) CONTRIBUTION TO BUSINESS SIZE BALANCE

b) CONTRIBUTION TO BALANCE WITHIN THE EEC

c) INTERNATIONAL BALANCE

d) FURTHERANCE OF EMPLOYMENT POLICY

e) UTILITY IN IMPROVING MARKET INFORMATION

ANNEX C2

PRACTICAL FIELDS IDENTIFIED

ANNEX C2: PRACTICAL FIELDS IDENTIFIED

C2.1 THE CONCEPT OF THE FIELD

As explained in Chapter 5, the whole set of slots which were potentially available at an airport over any given period can be divided into discrete fields of slots. These fields would reflect certain categories of operations, operators and routes, which were the subject of the authorities' policies. Each field has three elements in its make-up: whom is granted slots within the field, what slots are contained within the field, and what rules apply to the operators of these slots.

In a totally free market in slots at an airport, there would be just one field. It follows that the existence of more than one field compromises the free market principle. While some fields themselves might operate with free market rules, they could do so only with their subset of slots, and the supply of slots to meet demand would be constrained accordingly.

Fields do, however, provide the means by which governments can influence the size and operation of the market place in line with policy.

C2.2 PRACTICAL FIELDS

The analysis in Annex C1 shows that there are about 11 field types and about 250 ways of describing a slot. This Annex rationalises this number. The realities of current agreements and operations have led us to identify a maximum of 21 possible fields. Not all will be necessary in each of the options we have developed, but for the record they are presented here. A list of these practical fields and of those used in the Regulatory and Market Hybrid option is at Table C2-1. The latter are also shown in Figure 5.1 in the main report. Where the field is used in an option the reader should refer to that option in Chapter 6 of the main report for further details of the actual implementation of the field.

The EC field does require segmentation. The policy objectives require protection for New Entrants and for Public service. They also require some control of the size of the long and short haul balance at congested airports.

C.2.2.1 E C Short Haul

This field contains over half the slots at most EC airports and needs to be protected from EC Long Haul. Range qualification may be in the region of 3,000km. Details are expanded in Chapter 6.

C2.2.2 E C Long Haul

This field contains between 10% and 20% of the slots at most EC airports, and needs to be protected from Bilaterals. Range specification may be in the region of 3,000km. Special measures may have to be taken over the short stages of networks. Details are expanded in Chapter 6.

C2.2.3 Public Service

In a number of specific cases the public interest is better served by the setting aside of slots to ensure the provision of an air service to communities, which would otherwise be deprived of regular air transport to congested airports. Examples of such situations are air mail and passenger services to remote sites, islands or parts of the country at present under-served by air transport connecting to congested airports. Subsidies for slots (and provision of air services) might be provided if the public good justifies access to those airports. It is not anticipated that a great number of slots falls into that category, but most authorities require a mechanism to allow them to provide this type of support.

A field is therefore created to provide and protect essential those public services. Most of these routes are thin (less than say, 10,000 passengers per year). Some might even be subsidised by interested communities. The threshold in terms of traffic volumes and frequencies is to be determined by the national governements, above the level of the agency's Policy Function.

C2.2.4 Small New Entrants (SNE)

The suggested SNE definition introduces criteria covering the different financial and commercial power of large and established carriers. It also covers their different operational and financial structures and the relative importance of the new slots to the small carrier's operations.

This field is established with the specific purpose of fostering qualified small airline operators into the market place at congested airports. The specific route is of less significance than the size of the airline measured by an economic yardstick to be determined (eg turnover or trading profit) and the size or number of aircraft. Specific entry criteria are defined to favour small, established or new regional/commuter carriers which have been excluded so far from the congested airports. Provisions might extend to cargo and other types of services, if policy justifies it.

Fleet size Indicator:

A SNE might be defined in a manner similar to that suggested in the USA: as a carrier which has a fleet of at least 5 aircraft (cargo-passenger) and/or a maximum of 9 transport jets, with less than 4 (total) slots - take off or landing - per day at a coordinated airport. It could alternatively be an operator whose size was in the lower quartile of those operating from the particular airport.

Financial/Airline Status Indicators could be:-

- Number of passengers (or RPM) per year less than x (y).
- Cargo traffic (Revenue ton-miles) per year less than z.
- Percentage of operations applied for as a proportion of the carrier's total operations. This might be set at 20%.
- Genuine financial independence from established large/stage carrier

The threshold values (x,y,z) should be based on an analysis of the (readily available) economic and financial statistics of the industry. The concept would be refined in an iterative process between the policy and the allocation functions of the agency.

The suggested SNE definition introduces criteria covering true financial independence of small from large and established carriers, as well as actual operational and financial smallness and the relative importance of the new slots to the carrier's operations. This would ensure that the rules could not be circumvented by large carriers floating off dependent associated operators.

There might be a need to specify minimum sized clusters for SNE. In general these could be tailored to individual needs but might be:

Short Haul: eg 6 slots per day (3 landings, 3 take-offs)
Long Haul: eg 2 slots per week (1 landing, 1 take-off)

C2.2.5 Large New Entrants (LNE)

This field defines the slots to be granted to airlines other than the small operators as defined above and consists of all carriers (national, private, etc) which have been trying to initiate services on a route into and out of the congested airports for some time (historical application to airport co-ordinators), or have stated an intention to do so in the future (future applications). The agency faces here the most critical aspect of its intervention into the market place. Existing or latent demand for services has to be assessed in a theoretically unconstrained operational environment. A traffic model is needed to estimate the currently demanded mix of operators and tomorrow's desired mix (in 1, 2, 5 and 10 years). The agency will use the New Entry fields to achieve this balance between large operation.

Fleet size indicator:

No size limitation. The LNE carrier has presently less than y slots per day at the congested airport. These slots represent less than x% of the total slots allocated to the LNE field.

Minimum need for slots:

Same as small entrants.

C2.2.6 Slot Management

This field contains slots to be allocated for short term and day-to-day allocation to provide dynamic adjustment to manage unplanned surges and to allow for recovery from operational disruption. It will require these management reserves of slots to be made public. It will encourage open recording of the usage of opportunity slots.

C2.2.7 Cargo

This is a general field which includes all dedicated cargo operators, both scheduled, charter and short term unscheduled. Cargo flights are currently restricted at many congested airports, as at Heathrow and Gatwick by TDRs. Our studies indicate that those airports which are limited by terminal rather than runway capacity may use a cargo field. Much of the demand is currently met by short term trading.

C2.2.8 General and Business Aviation

The TDRs currently exclude business aviation at Heathrow and Gatwick during periods of peak congestion. This is a clear manifestation of the government's priorities in the present airport saturation conditions. This policy has forced the present operators in that category to exploit the ad hoc 'opportunity' slots. They presently do so in a very efficient manner, and complain about being excluded from the formalised airport scheduling and IATA forums. We estimate 4 to 6% slots fall in this category. Unthrottled demand might be as high as 8-10% of the total number of slots at Heathrow.

Again, the government has to decide, as a matter of policy, whether they want to maintain the status quo regarding general and business aviation. Some quarters claim that the damage done to the business community by exclusion far exceeds the benefits attached to a plane load of, say, charter passengers. There is no question that there is pressure to provide greater access to corporate and business operators. In a monetary option they can gain access provided they are willing to pay the going price, in competition with the other scheduled and non scheduled airlines for the use of a scarce runway. The rationale in a regulatory system is within the administrative process. The application of the present policies excludes a field allocated to general and business aviation. It does not mean that those policies cannot be revisited in the future. Our analysis of official policy objectives indicates that a field will be required. Its size is a matter of policy.

C2.2.9 Foreign General

This field caters to foreign routes and air services not operated under any bilateral agreements. Operators within the field will receive, upon full reciprocity with EC countries, permission to transfer to the EC fields. Slots in this field would not be granted grandfather rights beyond a limited period of, say 3 years. This would encourage operators to bring pressure on their own administrator to liberalise their rules towards EC carriers.

C2.2.10 Bilateral

Between 10% and 20% of operations at congested EC airports are expected to be operated by bilateral carriers. This field contains international, non-EC routes (eg, USA, Singapore). This field is to cater for binding bilateral agreements. Today approximately 550 bilateral conventions exist between the EC and other foreign countries. Therefore the legal framework cannot be changed rapidly. It is EC and UK policy to liberalise access to slots. Bilateral agreements freeze the allocation process. A concentrated effort will be needed to try and break down these 550 agreements and renegotiate them into as few sub-groups as possible. We propose that an effort should be made to encourage bilaterals to move into the EC fields. The EC have suggested that this should be achieved by granting full rights to any operative who can show that his home base offered full reciprocity to all EC operators.

Many bilaterals operate more slots than is provided by their agreements. We suggest that pressure might be applied by involking strict terms. This transition will require the creation of a Foreign General field, detailed above.

The qualifications for entry into the Bilateral field are that the carrier seeks to avoid the rules of sacrifice and allocation (including auction) which are applied to EC carriers. Also that the carrier is supported by a political or commercial regime which does not provide all EC carriers with full rights and reciprocity.

New carriers would enter the field through modification to bilateral agreements negotiated at government level (ie above the Agency Policy Function). They may supplement or replace specific bilateral incumbents.

C2.2.11 Scheduled Cargo

The present TDRs still exclude (as of 5 March 1991) whole plane cargo services from Heathrow and Gatwick during periods of peak congestion. If the policy makers perceive this provision as unduly restrictive with regard to the historical and latent demand, a number of slots should be set aside for scheduled cargo development routes. The size of the total (actual and latent) demand has not been determined but there are clear indications that some cargo carriers need slots as badly as some passenger carriers. They support very sophisticated scheduled freight operations and networks, and fast delivery service companies. We recommend some further analysis of the size of the field if the policy dictates its creation. The slots should be distributed to and used by small, large new entrants and incumbents in accordance with the qualifying criteria spelled out in the appropriate carrier category.

C2.2.12 Charter Cargo

Whatever applies to scheduled cargo carriers is also true for the charter operators, the major difference being the "ad hoc" nature of the traffic. One could argue that the distinction between scheduled and charter cargo operators is starting to wane. This is even more true in the passenger arena. If the policy makers want to differentiate between the two type of operations for certain reasons, it could be done but there is no real justification in doing so. Our advice is to combine the overall cargo category into one field reserved for that kind of operations if preferential treatment is deemed warranted to be given by the government. An analysis of the actual (and potential) demand for cargo operations should be completed before final recommendations are made regarding the size of the cargo slot field.

C2.2.13 European Community

All routes operated by EC Carriers belong to this field. It has also been proposed that any airline which can show full reciprocity with the EC at its base, as well as full commercial exposure, could join this field. Some fields are created to protect special segments of operators. Special ring fencing of big aircraft types, by nationality, fare type, service type, or by airline size is not concluded to be practicable. The market place should decide the economic viability and form of different services within the fields defined by the agency. Intra-European (EC) slots outside specifically protected fields should be freely used at the carrier's convenience, according to business objectives, and not to government's dictates.

C2.2.14 Commuter/Feeder/Regional Routes

This field is defined by the type of aircraft (eg turboprop with less than 30 seats, jet aircraft with less than 100 seats) and contains slots set aside to allow feeding to congested airport on this routes (hub and spoke, interlining). The field is designed to foster commuter and regional (third level) carriers.

C2.2.15 Thick Routes

This type of field is suggested in the current EC proposals. The field contains routes which are heavily served by established carriers, as a group. It may constitute the reservoir from which sacrifice will be performed. For individual airlines, any route served more than say, 6 times per day (or 12 slots) out of one congested airport may be included, especially if aircraft size is less than 200 seats. This type of intervention intervenes at a very low level within the operation of the industry. We do not consider it appropriate for the options we have constructed. The slots taken away from this field would be distributed to Small New Entrants and Large New Entrants according to the criteria, discussed in the SNE and LNE sections of this annex.

C2.2.16 Network Maintenance

This field will be created by the agency to ensure flexibility in regulation of the market and protection of fragile airline networks. This field could be combined with the slot management field (described below), the only difference being that the operators' networks may need semi-permanent protection for this element of their operators.

C2.2.17 Charter Passenger and Cargo

This field is geared towards charter operations in general, but the distinctions between these and scheduled operations is becoming blurred as scheduled operations increase bulk sales of seats and charter sell to the seats only market. Much of the charter field could be merged with the scheduled fields, leaving only a small rump, which might satisfy its demand if it were allowed to trade in the short term market.

C2.2.18 Long Haul

This is a generic field which contains all routes longer than say, 3,000 km. This field is established to distinguish and protect the short haul operations from being taken over (as might happen in the free market) by long haul operations. Most bilateral and other international route operations fall in this category. Short haul operations will be covered by another field.

C2.2.19 Short Haul

All indications are that there will have to be some differentiation between long haul and short haul slots, if the latter market is not to be swallowed by the former. The price which short haul can pay for slots in monetary systems is maybe one tenth that of long haul, if fares are to be maintained at around the current levels. The need to protect short haul carriers from long haul carriers also exists in non-monetary options.

To enable this short haul field to be kept as small as possible, the complementary fields of short haul feeder, network maintenance and airport management may be needed. These may overlap with the concept of the public service field described. It may be possible to merge these once the transition to the new slot allocation option has been completed.

C2.2.20 New Entrants

Many definitions have been proposed for new entrants. It is one the most controversial topics in any discussion about slot allocation systems. It is at the heart of all the proposed changes.

IATA now grants a "new entrant" status to an airline that makes a request which, if accepted, will not result in the airline holding more than 4 slots on that day at that airport (reference 1).

The EC defines (reference 2, op cit, p16) a "new entrant" as a carrier

1. Not holding more than 3 slots on any day at a coordinated airport and requesting further slots for services on that day,

or

2. Not holding more than 30% of slots held by all carriers on a day at a coordinated airport or at another airport in the same airport system and requesting further slots at that airport during that day to commence services falling within the scope of Regulation (EEC) 2343/90 on a route on which at most two other air carriers are exercising third of fourth freedom traffic rights between the airports concerned during that day.

All new slot proposals we have studied contained versions of one or both elements identified above. They crystalise two major themes: the large or small carrier trying to expand out of a very small slot base at an airport, and the "mega carrier" in a position of dominance initiating new services. We feel that the liberal and continuous application of these rules may fracture the industry. Although they disturb the status quo they do not seem to guarantee increased efficiency, a greater choice and lower fares.

We have identified the carrier size as a real discriminator in the future competitive world of air transport liberalisation and are thus proposing two fields to address the problem of the integration of new entrants in the slot system. These two fields are discussed under SNE and LNE earlier in this annex.

ANNEX C2
TABLE C2-1

LIST OF PRACTICABLE FIELDS

	TITLE	USED ON OPTION	
		REGULATORY	MARKET HYBRID
1	EC SHORT HAUL PAX	√	√
2	EC LONG HAUL PAX	√	√
3	PUBLIC SERVICES	√	√
4	SMALL NEW ENTRY	√	√
5	LARGE NEW ENTRY	√	with (1) or (2)
6	SLOT MANAGEMENT	√	with (20)
7	CARGO	√	with (1)
8	GA and BUSINESS	√	with (20)
9	FOREIGN GENERAL	√	with 10
10	BILATERAL	√	√
11	SCHEDULED CARGO	with (7)	with (1)
12	CHARTER CARGO	with (7)	with (1)
13	EUROPEAN COMMUNITY	Fractured	Fractured 1,2,3
14	FEEDER ROUTES	with (2,3)	with 3
15	THICK ROUTES	N/A	N/A
16	NETWORK MAINTENANCES	with (6)	N/A
17	CHARTER	Fractured	Fractured 1,2,7,10
18	LONG HAUL	Fractured 2,10	Fractured 2,10
19	SHORT HAUL	Fractured	Fracture
20	NEW ENTRANTS	Fractured 4,5	Fractured 4
21	ALL OTHER	N/A	√

ANNEX D

TERMS OF REFERENCE

D1: STAGE ONE

D2: STAGE TWO

JOINT CAA/DTp STUDY ON SLOT ALLOCATION

Terms of Reference

1. The objective of this study is to compare possible future systems for the allocation of slots at congested airports with the present system involving airport scheduling committees and grandfather rights.

2. The two main alternative options for future systems that are to be assessed are:

   a) the existing system based on grandfather rights, but modified to provide better opportunities for:

      - new entrants; and/or
      - large aircraft.

   b) a new system of slot auctioning

3. Other options to be considered are:

   - the existing system based on grandfather rights but modified to provide better opportunities for year round operations;

   - a system incorporating frequency limits on busy routes, perhaps in combination with other options considered;

4. The study is to assess the likely behaviour of airlines insofar as it affects their valuation of slots.

5. The study should confine itself to systems that would be operable within the European community. The consultants will need to demonstrate how such a system could co-exist with a system based on existing IATA slot allocation procedures elsewhere.

6. The study will need to consider any special issues raised by airspace congestion.

7. The study will need to comment on the implications of the options considered for the competitive structure of the industry.

8. The study is required to come up with practical proposals having regard to the constraints of the real world including legal, practical and institutional constraints.

9. The framework within which the above issues are to be considered is further developed in the attached Annex. These should be regarded as an integral part of the terms of reference.

10. The study will report to a steering group comprising senior members of the CAA and Department of Transport who will guide the work as necessary.

11. Study, will be conducted in two stages. The first (Stage 1) will involve a preliminary look at the main topics and options in order to assess which options are the most likely to be fruitful and worthy of more detailed study. A report on this stage will be required by 30 November 1990. No decision on a second stage (Stage 2) will be made before the report on the first stage has been received; if the second stage goes ahead the final report will possibly required by the early spring of 1991.

ANNEX

AIRPORT SLOT ALLOCATION: FRAMEWORK FOR CONSULTANTS' STUDY

BACKGROUND

1. The demand for landing and take-off slots at Heathrow and Gatwick, and at certain other European airports, exceeds supply. The popularity of Heathrow and Gatwick is such that whether or not additional capacity is provided elsewhere in the South East of England this gap is likely to widen still further.

2. Under present arrangements slots at congested airports are distributed by scheduling committees of the resident airlines. These committees work on the basis of internationally accepted rules and conventions, one of which is the "grandfather rights" system under which airlines which already hold slots are entitled to retain them in subsequent years so long as they use them.

3. The grandfather rights system restricts new entry and limits the extent to which slots can pass from one airline to another (although exchanges can and do occur). This inflexibility also raises the question of whether alternative methods of slot allocation might better ensure that slots go to those airlines which can make the best use of them in terms of users' needs. One option is to reduce the imbalance between supply and demand by use of the price mechanism. Others include preference for certain types of service (eg year-round, long haul or those using large aircraft), frequency limits on busy routes, setting aside a proportion of slots for new airlines/routes, and similar schemes.

4. There have been several studies of slot allocation, but there is a need for further work on how this and other possible alternatives to the present system might work in practice and how far they are compatible with a policy of encouraging airline competition.

OBJECTIVES OF A SLOT ALLOCATION SYSTEM

5. Any slot allocation scheme has to be evaluated in terms of its compatability with the following overall objectives:

i) To further the reasonable interests of air transport users.

ii) To increase the scope for and likelihood of airline competition.

iii) To reduce rigidities in the system as to so enable slots to be used more efficiently.

A further desirable objective could be:

iv) To give a degree of protection to smaller airlines.

The purpose of the research is to consider whether alternative systems would work better than the present one in terms of achieving these objectives, and to weigh the alternatives against the existing system and against each other.

LEGAL CONSTRAINTS

6. Any scheme must take account of the following constraints.

i) International obligations, such as the Chicago Convention and Bermuda II;

ii) Bilateral agreements;

iii) BAA's regulatory regime, including the price cap formula;

iv) EC Commission proposals and directives, which are likely to rest on the existing framework.

7. These legal constraints make it necessary to assume that any scheme which involved either preference for particular categories of service or the rationing of slots by price would apply to flights within the European Community only, at least initially. The consultants will therefore need to consider the practical implications of managing the new scheme alongside the continuation of present arrangements to non-EC destinations and to take account of considerations such as differential growth.

PRACTICAL AND INSTITUTIONAL CONSTRAINTS

8. Any scheme would also have to take account of the following.

i) The need to match slots with other airport constraints, eg on terminal and aircraft parking facilities.

ii) The need to match slots at origin and destination, and compatability with IATA arrangements for co-ordinate airline timetables;

iii) The need for some stability and continuity in scheduled service planning.

iv) The need for some co-ordination between airlines of timetables, for example to maintain connections.

AIRLINE BEHAVIOUR

9. In considering the options to be studied it will be important to consider what governs airlines' valuation, in the short and long term, of existing and newly available slots. Do they maximise:

a) Profit?

b) Output, subject to a minimum profit constraint?

c) Network size?

d) Something else?

e) A combination of these?

10. To what extent is this valuation affected by the following factors?

a) The size of the airline?

b) The degree to which it dominates particular airports or markets.

c) Its opportunities for growth at non-congested airports.

d) The scope and pattern of its network.

e) Its corporate culture.

f) Its ownership.

g) The number of routes which are potentially competitive (eg in the EC).

h) The number of routes which can reasonably be expected to become competitive.

i) The proportion of its operations conducted from airports to which the scheme would apply.

THE PRICING OPTIONS

11. The focus of this work should be on a system of slot auctioning, including the possibility post-auction trading.

12. Against this background it would seem fruitful to examine the following issues or groups of issues.

a) Basic Practicalities

i) could a practical and formalised system of slot auctions, with post-auction voluntary slot trading, be introduced, restricted to intra-EC services?

ii) could and should the system be introduced gradually or experimentally, (eg on the basis of a rolling annual programme) to reduce the risk of chaos if a comprehensive scheme were introduced all at once and found not to work?

iii) what kind of property rights, and for what period, should be given to slots? (eg an absolute right of indefinite duration would be of great risk if a scheme were found not to work. And such a right would pose practical difficulties if a scheme were introduced gradually.) Should the right be for a limited duration, say 3-5 years so that the property right effectively lapses at the end of the lease period?

iv) is an independent slot broker desirable? Or should the existing grandfather holders be allowed to auction their own slots?

v) How should the initial allocation be made?

vi) What should be the rules for a "use or lose it" provision?

b) Competitive Implications

i) if large airlines are successful at bidding for slots at congested airports, will airline competition be diminished? (That is, compared with the present or alternative system of slot allocation, even if full liberalisation takes place);

ii) will airline domination of an airport, (eg more than 30% of movements) require special measures? Examples of such measures might be a limit to the proportion of slots held, or slots allocated especially for entrant airlines;

iii) as an extension of ii), does the imperfect nature of the aviation market arising from historical advantages, its generally duopolistic structure, the present trend towards concentration, government ownership or support, network benefits, the industry's tradition of co-operation, the competitive importance of frequency and differences in the opportunities for competition mean that special provisions against anti-competitive behaviour are necessary? Will small carriers be at a competitive disadvantage even at uncongested airports?

c) Proceeds of Sale

Whoever acts as vendor of the slots, whether the airline, the airport authority, or a slot broker, the question of who keeps the proceeds must arise. There will be competitive implications. If the airline sells its own slots: should the vendor retain all the proceeds? If the sale is through an independent broker it is assumed that the net proceeds will go to the Exchequer.

d) Game Theory

Could game theory provide useful insights into the outcome of auctions or trading? eg could it tell us about the effect on UK airlines? What part will uncertainty play? (eg how will various possible differences, or even imprecisions, in the definition of slot rights affect the incentives to buy and sell?)

NON-PRICING OPTIONS

13. These systems would retain grandfather rights in a central role, but involve setting aside either a proportion of slots or giving a preference to slot applications by particular classes of user. The practical issues that need to be addressed with such systems are:

- how slots are to be removed from incumbents;
- how they are allocated;
- what proportion of slots are needed to make the scheme effective.

DTp SLOT ALLOCATION CONSULTANCY: STAGE TWO

SUPPLEMENTARY TERMS OF REFERENCE

Background

The report on Stage One of the consultancy was published on 21 February 1991. At the same time the Secretary of State announced that he had asked the consultants to proceed to Stage Two of the study, focusing initially on two of the options identified in Stage One. This would not preclude further study of other options at a future date.

The Stage Two work is to be carried out within the framework of the original terms of reference (including its annex). The purpose of this document is to supplement the terms of reference in the light of the Stage One work, in order to define more precisely the scope of the work in Stage Two.

Options

The study is to examine two options in greater depth, the "full regulatory" option and the "market hybrid" option. The Stage One report outlined how each option would work, but the details may need to be modified as further study proceeds. The study will apply the methodology developed in Stage One to each of the options, to design systems that are stable, predictable, and responsive to changes in market conditions.

Policy Consistency

The study will analyse each option in terms of policy objectives identified after discussion with the Department, bearing in mind earlier interviews with other Departments and organisations, and the objectives of a slot allocation system outlined in the main terms of reference. The aim is to design systems of slot allocation that are compatible with the objectives of existing civil aviation policy, and that would be robust in the face of future policy changes.

Industry Attitudes

The study will build upon the work carried out in Stage One to analyse how the industry would react to the introduction of different slot allocation mechanisms. For each option the study will consider how the probable response of airlines would affect the competitive structure of the industry, including:

a. the distribution between long-haul and short-haul traffic;
b. the impact on domestic services (especially "thin" routes);
c. the distribution of traffic among airports in the London area, and the effects on regional airports; and
d. the impact on business and other general aviation users;

The study will include interviews with representatives of the Scheduling Committees at Heathrow and Gatwick, and with an organisation representing air transport users.

Legal Analysis

The study will explore further the legal implications of each option within the guidelines set out in the original terms of reference.

"Ring-fencing"

An important objective of the study is to see how the systems of slot allocation being proposed could operate throughout the EC for intra-EC services, alongside the use of the IATA guidelines for services to extra-EC destinations. The practicalities of segmenting the total slot pool to "ring-fence" slots for intra-EC services will be explored, including:

a. the initial division;
b. subsequent changes to reflect shifts in demand;
c. fifth freedom services;
d. (for the market hybrid option) the effects of attaching prices to slots for intra-EC routes but not to others.

Matters Specific to the Full Regulatory Option

The study will explore:

a. if reallocation of slots is to be by lottery, the detailed operation of the lottery;

b. the practicalities of different use-it-or-lose-it provisions.

Matters Specific to the Market Hybrid Option

The study will explore:

a. different auction mechanisms, an important objective being to discourage dominant or predatory behaviour;
b. how slots might be grouped for auction;
c. the optimum length of slot leases;
d. the flows of money in the system, and the probable effects on prices and airline profits.

The Agency

Each option involves the operation of a regulatory agency. The study will advise on the nature and role of the agency.

Transitional Arrangements

For each option the study will examine the transitional arrangements that would be necessary leading up to the implementation of the final system. The objectives are the minimum of uncertainty and disruption, and the opportunity to modify the system in the light of experience.

Steering Group

The consultants will report to the Department's Steering Group as required.

Timing

The consultants will produce a written report of the Stage Two work by 26 July 1991.

CAP/DTp
March 1991

ANNEX E

COMPOSITION OF STUDY STEERING GROUP

COMPOSITION OF STUDY STEERING GROUP

DEPARTMENT OF TRANSPORT

A J Goldman
Head of Civil Aviation Policy Directorate

D S Evans
CAP1 Division

M C Smethers
CAP1C Branch

M Mann
EcASM

Dr E Weinstein
EcASM

ANNEX F

STUDY PLAN

08/02/91

SLOT ALLOCATION STUDY - STAGE 2
WORK SCHEDULE